

T H E S I S

on

PERMANENCY IN OREGON'S FOREST INDUSTRY

Submitted to the

OREGON STATE AGRICULTURAL COLLEGE

In partial fulfillment of
the requirements for the
Degree of

MASTER OF SCIENCE

by

Sinclair Albert Wilson

June, 1930

PERMANENCY IN OREGON'S FOREST INDUSTRY

Introduction

Building values - creating and increasing - so that everything we touch may be better for our having lived -- these are the worth while things.

One of the finest opportunities for public service, for lasting good, not only for our own selves, but also for our children's children lies in Forestry. Perpetuating our forests so that we have continuous and profitable use and employment and at the same time clothing nature with trees where trees belong, combine the material with the aesthetic, both forces creating and increasing - - building values.

Oregon's situation affords an unequalled opening for study. We have the accumulated experiences of every other state and of the forest industry in general. We may learn the traditional influences; pioneering spirit, contentment of the inexhaustibility legendarian and the emotional appeals of the super-conservationist. We possess the advantages of an enlightened age. We own our nation's last great virgin timber stand. No where could there be pieced together more pertinent information to be used toward the desired end - permanency.

But permanency must follow stability and stability we have not. No part of agriculture has suffered greater depression nor faced more serious problems than tree farming. Admittedly there is instability in the industry. Solve this, right the condition,

and we are on the road toward our goal.

There is no one answer to instability. Many claim that improper financing is the great fault. Many pin the blame upon marketing, or upon manufacturing or upon remanufacturing. Others hold that logging is at the bottom of the situation and still others point at the forest and the soil. I have gone down the line with financier, salesman, manufacturer, logger and silviculturist and conclude that all are so interwoven that we must analyze the situation broadly, strike for practical remedies and set up dependable policies for future guidance.

Because of the fundamental nature of this subject, I confess to a sense of the minuteness of my being. If through this work I have contributed anything whatever of lasting benefit, I shall be content.

CHAPTER I

Oregon and Its Forests

Every man, woman and child in Oregon should give serious thought to the subject of forestry, for it has to do with much that affects them to-day, to-morrow, in the future and even for all time. It has to do with employing our lands properly and profitably; maintaining our established industries for the wealth they bring and for the pay rolls they provide; upbuilding transportation facilities and preserving the economic independence of individuals and of the public.

Forestry may be defined broadly as that branch of agriculture which deals with growing, harvesting, manufacturing and marketing tree crops.

It is axiomatic that land should be put to its best use and kept busy. Commercial forests should not be grown where higher land use is more profitable and intensified farming should not be attempted where tree farming pays best. Five-twelfths of all Oregon, according to statisticians, (approximately 25,000,000 acres) is fit only for growing trees. It is too poor in soil quality, too remote and too rough for other economic employment.

If we were to trade our forest areas to Illinois or Iowa for equal areas we would take 70 percent of either State. Oregon's essential forest lands are as great as or greater than the gross area of any one of the following states: Virginia,

Tennessee, Ohio, Kentucky, Indiana, Maine or South Carolina. They are greater in extent than the combined gross land areas within the following states: Maryland, Massachusetts, New Jersey, Connecticut, Delaware and Rhode Island. We could drop every one of these six states in the Oregon woods and lose them.

Our forests constitute the Nation's last great stand of virgin timber. To be sure, there are substantial blocks remaining in Washington and California, but the total original growth has been materially reduced. There is nothing consequential left of mature forests elsewhere. Even the healthy but spotted second growth of the south is being rapidly reduced. Considered as a whole, the gap between mature and immature stands is becoming wider each year. Even in Oregon we have stripped certain areas without a definite program of continuity. Nevertheless, our opportunities for intelligent conservation are most excellent.

The ownership of our timber lands is broad. In addition to Federal, State and Municipal Reserves there are said to be some 30,000 individual owners.

The nation is vitally interested in growing successive tree crops for human needs. Abundant forest crops are essential for maximum national welfare. The nation therefore is interested in Oregon.

One half of our vast timberland area is owned by the United States Government administered under able leadership and by

competent men. The government is in actual partnership with the people of Oregon. National forests are interspersed and intermingled with private holdings - - not separate and apart. It is right that we expect the government to play a very definite part. It is a responsibility the government owes to any commonwealth just as any individual owes it to that commonwealth. This sort of participation is one of partnership more than of paternalism. The Government owns 13,000,000 acres of Oregon's forest lands and perforce is a party to the case.

Our climate lends itself readily to continuous and rapid forest growth. Only in the south and in the California Redwoods do we find greater increment. Given wet seasons in the coastal regions and our long growing periods throughout the state, we are indeed fortunate. Oregon and Washington alike admittedly are in an enviable position in comparison with the majority of Eastern states with reference to their forest lands, measured in terms of nature's favors.

Cattle, sheep and the forests are allies. Dependence of the industry upon summer forage in timbered areas is ever pressing. E. N. Kavanagh, Assistant U. S. District Forester, reports "twenty-five to thirty million dollars worth of beef, lambs and wool are produced annually in Eastern Oregon, not to mention by-products of the ranges that find their way to market and help swell the wealth of the state. Upwards of \$100,000,000 worth of property is necessary to produce this income. The cost

of production, involving labor, supplies, taxes and a multitude of other items, runs from 022,500,000 to 025,000,000 more per annum. Quite a tidy little business when conservatively rated."

Irrigation districts take their waters from within the forest reserves. Thousands of farmers rest their fortunes upon the protection of watersheds, reservoirs and flumes. New areas still to be reclaimed are dependant upon watershed protection. Likewise cities derive water supply more and more from our tree clad mountainsides. Prevention of watershed erosion, dam siltting and river clogging depends largely upon our forests. The relation of forest to flood control is becoming better understood. It has long been recognized in older countries that the secret of permanent flood control lies at the source rather than at the mouth of mountain streams.

Recreational opportunities are more and more imperative for the continued health of a rapidly growing populace. Oregon's forests attract thousands annually. Hunting or fishing or the plain joy of just communing with nature over has proved its value. Then too there are the financial aspects of recreation--revenues to individuals and to the public through rentals, leases, licenses and tourist expenditures.

Our lumber industry means much to us. Its loss would prove incalculable. Virtually the whole Earth pays tribute to Oregon through this channel. The annual value of our lumber

products f. o. b. mills approximates \$120,000,000.00. Keep this up in perpetuity and it takes huge dimensions. Yet this is possible. The present annual cut amounts to less than two per cent of the state's entire stand. With a potential raw supply always possible, can we afford idly to watch this industry go into liquidation as it always has in other states when their "inexhaustible forests" have been abandoned? No logs - no mills. It is a challenge.

Of this production revenue, a large proportion goes to its 45,000 and more employees giving daily bread to some 200,000 men, women and children. Forty-four per cent of the towns of Oregon, with 500 or more population are wholly or chiefly dependent upon the lumber industry for their existence. Thousands of railroad employees, longshoremen, seamen, iron workers, farmers, merchants and other skilled laborers, business and professional men are dependent upon timber production. As lumber is depressed, so is Oregon's commercial pulse, for sixty cents out of every dollar banked here is lumber-made.

A large proportion of outgoing ship tonnage and an even larger proportion of outgoing rail tonnage consists of forest products. It amounts to approximately fifty-four per cent of ship and seventy-five per cent of rail movements. Any material curtailment inevitably influences freight rates on all other incoming and outgoing commodities - - every farmer, merchant, manufacturer and consumer is concerned. Low cost transportation is

essential to successful competition in board markets; we may not live safely within ourselves; we produce more than we consume; our thickly settled markets are at distant points closely surrounded by keenly competitive areas with short freight haul advantages; forestry plays a strong part in our commercial welfare.

Crop diversification plays no small part in the broad problems of agriculture. Part of the answer in Oregon is Christmas trees, a growing trade, together with spruce, fir, cedar, pine, alder, locust and a multitude of other valuable species important not alone to the lumber industry but also to the general farmer. Through such land use, we keep our poorer areas from competing with the highly productive ones in the growing of hay and cereals. Nation wide attention is being given to this subject of use and rent. Because of the broad operations of diminishing productivity, the drift has been away from poorer toward the richer soils.

There is an increasingly better understanding of the relationship of profits to proper crops and cropping, labor and capital. In the struggle to equalize expense and the value of the increment of product attributable to the marginal use of each class of productive agents, the sifting process has marched steadily on. Soil quality, topography, climate, location, accessibility, transportation rates have their direct bearing upon the amount and price derived from physical products of the

soil. So in measuring rent we must finely balance the superiority of land which pays over land which does not pay or simply breaks even. With an increasingly broader knowledge of these very important factors, we realize more and more the part tree crops play in profits to be derived from the land itself, from broad diversification and from removal of low grade areas out of the field of competition with better lands suitable to higher use and entitled to freedom from that type of competition. Add to this, the experience of the east and south from clearing forest type soils for intensive cultivation and the consequent failures and reversions and Oregon should be able to sail a reasonably true course. Timber exploitation has not progressed so far here, that we need suffer greatly if we will only take heed.

In this age of destructive agricultural competition, the forests play another beneficial influence in Oregon through furnishing cheap lumber, fence posts and fuel to the farmer. The farmer of the middle states is paying our price plus as much again for transportation plus the retailer's profits thereon. Our costs of necessary construction of barns, houses and fences is one third to one-half that of the east per thousand feet used. Thus our capital requirements are less, which influences largely the rent we must derive to make a reasonable profit, which again helps to offset competitive factors in domestic and foreign markets.

Given permanency to the lumber industry, we may hold many improved acreages in intensive use where otherwise they would be

abandoned, especially when in territories tributary to logging and milling operations. Proximity to a consuming populace, a semi-primary market, reduces land quality and long haul factors in competition. Rail and water facilities, made possible through timber operations, afford a means for the disposal of surplus.

Federal statistics show that Oregon farmers own over 2,500,000 acres in wood lots. Some of the land will be cleared in the future. Some of it is suited to present and future higher use. Some of it should always be kept in trees. Use and rent again play a part. What are the revenues to be derived? Are not fuel, poles, posts, lumber and small by-products items for consideration? Are not windbreaks and shelter belts factors in fruit, grain and livestock protection? What of the personal comfort of the occupant be he owner or tenant--does not this have a direct influence, to say nothing of beauty's influence upon value? In Southeastern Oregon, where natural tree growth is scanty, farmers are paying as high as \$16.00 per cord for cottonwood and their annual fuel bill reaches \$320.00 per farm in many cases. Corn cobs and coal and oil have been long in use on the forest depleted farms of the east, and they have waste land upon which a continuous supply might well be grown. Oregon farmers are favored by natural surroundings, by the presence and ownership of extensive wood lots and by the advancement of science in determination of soil quality and productive capacity. These numerous small holdings should be valued in dollars and cents, should

not be cleared until it can be shown that greater annual profit can be derived therefrom without depreciating farm sale value to a greater extent than such increased annual profit would justify.

Then there is another valued resource in Oregon's forests-- timber fringes along our highways. They afford comfort and joy to the wayfarer and lend an unmeasurable commercial and aesthetic asset to Oregon. They attract tourists from all parts of the land to view their wonders and these tourists through their trade give to the local inhabitants a means of living. In turn, they bring to us out of this horde of tourists, future settlers, laborers, farmers and industrialists. We take cognizance of the influence of beauty upon civilization. An attractive country and pleasant surroundings builds and endows us with physical strength, mental alertness and spiritual fineness.

Towns, cities and state cannot long exist without tax revenue. The tax contribution from forest, mills, factories, laborers, stores selling to them and farmers dependent upon them, in the aggregate is the life blood of political subdivisions located in essential timber land zones. With no timber, no mills, their credit is gone and independence destroyed. Tax revenues shrink to a point where they become dependent upon the state at large, for if they cannot pay the state's bill, others who can, must. More than this, these areas must be subsidized if they would play their just part in the costs of government and in the social scheme of things. Rehabilitation is a long, trying and

expensive proposition. Virtual bankruptcy of counties has happened so often in other states that only folly could blind our eyes to the situation.

Is there any conclusion other than this that continuous and intelligent use of our forests is essential to Oregon's fullest development? Is it necessary here to trace the influences of forest upon civilization to further prove the case?

CHAPTER II

HISTORICAL INFLUENCES

When first our forefathers set foot upon this continent they were confronted with an impenetrable forest of unbelievable extent. It was everywhere--north and south and west, even to the Mississippi and even perhaps beyond, who at that time, knew.

If the immigrants would live they must have food. According to standards of their civilization that meant pastures for livestock and cultivatable ground for crops. But there were few if any open spaces. Trees covered the land--they were in the way of progress. Which was of greater value, forest or progress? The latter, certainly. In fact the former was so abundant that it had little if any value. Therefore the forests must go and go they did. As settlements increased in size, number and extent, the need for land increased. Ownership of farm land, not dollars and cents, became the measure of a man's wealth. In fact it early formed a basis for taxation from which only now are we breaking away to any marked degree. Costs of government were small so taxes were comparatively low. Regardless of producing capacity or character, land was cleared and cultivated. "If soil will grow trees it will grow grasses and grains" so the early settlers held. The need for food at home was ever increasing, and if by them there was a surplus people across the Atlantic would receive it with open arms. Thus we marched from the east

towards the west.

The forest harbored unfriendly Indians and savage beasts, potent enemies of our early settlers. From out the woods came red terrors to burn homes, to butcher men and boys and to make off with women and girls. Wild animals preyed upon their livestock and children. There was no safety in the trackless fastnesses. Organize as they would, scanty numbers prevented subjugation of the red man and extermination of predatory animals. Regardless of his own short sighted policy toward the Indian and of his ignorance of control, we must look through the settler's glasses if we would see clearly. The forest harbored his enemies, therefore the forest was his enemy. The more rapidly it could be done away with, the better.

But as population grew, there was increasing need for forest products. Well enough for the first settlers to hew out their own homes. But urban conditions soon changed the order of things. These people were busy with other matters and had no time to seek out their trees. Lumber for the home, fuel for the fireplace and masts for ships were needed. What was waste turned to value and a new industry was born. From the whip saw through water and steam power, to the electric mill, from ox team to barge, to railroads and from struggling colonies to throbbing metropolitan centers we have witnessed its course. The great supplies of the New England States were reduced, then those of Pennsylvania and

New York, then the Central and Lake States, then the South and now we are at our last great virgin stand the Pacific. There was always more timber to be cut, so why worry!

Out of need of agricultural lands, of fear of savages and wild beasts and of continuously new fields to conquer, naturally came those ingrained beliefs, that all tree bearing soils could grow cereals or forage, that forests stood in the way of progress and safety and that there was an inexhaustible supply, one at least equal forever to the needs of America. You will find this attitude here and there, even today.

Early spotted attempts were made toward conservation, but it was not until well after the civil war that any definite momentum was gathered. Scientists saw that many soils could not successfully produce annual crops for any length of time if at all. They held that savages of the forest could be controlled. And they pointed to a time, as a nation, when we would feel the pinch of a timber shortage.

With better control that fear disappeared. But our rapidly growing nation was hungry. Intensive cultivation had not become a reality. Knowledge of soil values was limited. Therefore this demand coupled with the inexhaustibility doctrine proved too much for the scientist to combat. Well do I remember the discussions about my father's table when I was a boy in Michigan. Ken held firmly to faith in the productivity of her sand dunes, which they would cover with peach trees and vineyards, while

others said: "cut timber clean as you go, as there lies an illimitable empire always beyond." But my father, a practical lumberman, one whose boyhood was spent in growing hay between rocks, simply said, "Northern Michigan is soon done for; opportunities for my children here will be limited; we will go to the Pacific Coast where I hope we may witness a different order of things." We moved west.

Demand for added areas for intensive cultivation waned with supply approaching and then exceeding demand. Broader knowledge of soil values demonstrated the fact that vast expanses had been cleared at tremendous expense which would not support continuous agricultural crops. Communication facilities brought distant highly productive acreages into sharp competition with poorer lands in close proximity to metropolitan centers. Intensive cultivation drove home the peg and farm abandonment became increasingly noticeable. People began to harken unto the scientist. So the battle simmered down to one of conservation versus inexhaustibility.

Like all good moves, the idea of conservation brought forth the extremist. For a time the stage was pretty much his own with his trumpeting, "save that tree, bottle up the forests, twenty more years and we are through, down with the timber baron." The appeal was popular though not logical, in which fine impulses governed rather than sound judgment. Because of resultant bitterness, progress was somewhat hampered. Nevertheless the

super-conservationist served his purpose in arousing a lethargic public and a lethargic industry.

Broader views then took the field. It was found that the timber industry was not entirely at fault and needed assistance. Land ownership, problems of manufacturing, marketing and finance were intricate. Protection from fire, insects and disease in timber were as great a public responsibility as protection from insects and disease in grains. Many economic obstacles were to be hurdled. The inexhaustibility legendarian came to a realization that although we would always have some trees, we were approaching a time when a national shortage would be felt because of the gradual widening of the gap between mature and immature stands. Operators began to awaken to a greater public responsibility. Through broader views came a better understanding of what true conservation actually meant--continuous and profitable use of our forests.

This brings us to today--the age of co-operation in which all interested parties strive in order that the idea of true conservation might become an accomplished fact. To reach this point took years. While its course was oftentimes bumpy we now find more concerted and intelligent action upon the part of foresters, timbermen and the public, for the purpose of making continuous use a profitable undertaking.

CHAPTER III

WHERE SHALL WE STRIKE?

Were it my purpose herein to treat this subject from a purely historical angle, I should include transitional stages in Oregon ownership of lands. Such a treatise would cover various steps from territorial days, through early statehood down to today, coupled with a detailed estimate of future possibilities as marked by trends of the present. Passing off title from federal to state, railroad and private ownership, interweaving, reversion processes, political versus economic boundary alignments, forest reserves of the nation and state and its political subdivisions, all these are interesting and instructive. Pre-emption and commutation, homestead, desert land, mining, timber cutting, and timber and stone acts, together with railroad and other grants have had a marked influence upon the Oregon situation.

Statistical information as to original and present stands, while plentiful, is not reliable because based upon estimates instead of upon accurate measurements. Such a study should include accurate data as to volume, species, age and location. Actual depletion by cutting, fire, insect attack and old age is not known. The extent of our forest type soils in terms of to-day's land use is just being discovered and even this will change with ever shifting economic uses, necessary under the influence of supply and de-

mand.

One might even enter the field of romance--comedy and tragedy are to be found aplenty. Thievery, sabotage, crime detection, heart-breaking experiences of the past, blasted hopes, ruined fortunes and social upheaval are all tied in with the history of our forests. They are thrills for another place.

Let us confine ourselves to the situation as we find it, and by the use of logic through the aid of statistical information and experience upon which we may depend for the sake of comparison, arrive at an understanding of at least some of the things we must do to arrive at the ideal. What is this ideal? I believe it to be this: Sustained yield on all essential forest lands, logically located manufacturing and remanufacturing plants, utilization of woods and mill wastes and constantly broadening markets for all of these.

The situation as we find it is anything but ideal. Some have attempted to place the fault at the door of finance, or at marketing or manufacturing, logging, silviculture and taxation. The very effort to find out obstacles and remove them, though spotted, has done much to arouse a broader understanding. As before indicated, I find each branch of the subject a contributing factor to depression. The entire matter is interwoven. Repetition therefore is unavoidable. In as practical a way as I now have, I shall try to present certain evils and remedies, from marketing down to land use.

CHAPTER IV

MARKETING

Perhaps no major national enterprise, has ever shown such disorganization in the disposal of its products as lumber. In the past few years we have witnessed spasmodic healthy demands, but generally, demand has not been up to par. Investigations reveal that per capita consumption has decreased fifty per cent. National production this year will probably leave a twenty percent surplus.

Lack of intelligent advertising has permitted the public to drift away from lumber. Hysteria of the ultra conservationist and blatant trumpeting of the extreme utilitarian have been disruptive. Competing substitutes have done their share in exciting the so called "conservationist." Appeals to the public to save the forests by using other than forest products have materially eaten into the market. No matter how well intentioned it may have been, there is no denying the fact that the buying public has been influenced.

Dealers have thought in terms of 2 x 4's instead of refinements in use. They were and are too easy to sell, hence they afford the line of least resistance. Probably the most outstanding example of substitute encroachment is that of shingles. There was much to criticize in the cedar shingle and its use. People had put on thin, flat grained pieces, because they were cheap. They laid them

over open sheathing, block tin flashing and valleys, and tacked them on with ordinary iron nails. An aggressive campaign of advertising was put on by the roofing substitute people and naturally lumber dealers added them to the line. But the real crime lies in the fact that the cedar people did not and have not yet snapped out of their lethargy to advertise their own product and to show people what to buy. And it was all so worth while and so easy compared with the effort made to dislodge this worthy product. As a matter of fact, a roof laid with solid sheathing, copper valleys and flashing, half inch vertical grain shingles four and one half inches to the weather, put on with copper nails should last for forty years. Despite advertising to the contrary, there is no asbestos roof that will last and there is no imitation line that will not burn; in fact they burn more readily than cedar shingles in most cases. Despite advertising to the contrary, there is no imitation roof known that is a moss preventative. The aggressive advertising of the substitute people coupled with lack of initiative of the cedar industry, have led to a differential insurance rate in favor of the substitute; unwarranted and injurious and difficult to upset.

Within the past few years, a tardy but encouraging attempt has been made by the National Lumber Manufacturer's Association and by regional manufacturers associations to educate people in better uses of wood. Meat packers long ago recognized the fact that their industry would perish as a great institution if the public were not

educated to the various uses of meat and its by products. They have gone even to the extent of employing expert technicians in explaining and introducing their some sixty medical by-products to the medical profession. Not content with newspaper and magazine advertising, they have gone from office to office. And they have profited. If we would meet competition in the use of wood with success, we must use some such method as the meat packers. Why not?

Research has been slow in determining fitness and use of species, forms and by-products. Much of this has been left to the individual retailer with his line of "least resistance." Some has been left to the architect to uncover. In other words, the lumber industry was waited upon a market, instead of opening a market. This concerns general construction, interior finish, furniture and furniture parts, pulps and papers, boxes, crates, baskets, utilization of waste, destructive distillation of wood, rayon, excelsior and the like. Work has been largely confined to federal endeavor, in co-operation with educational institutions. The Forest Products Laboratory at Madison has made noteworthy progress in experimentation and opening up new and better uses. This year finds Congress allotting additional appropriations to this station. In so doing it recognizes a public responsibility to teach the consumer to be a better buyer of forest products and to uncover broader markets for a great natural resource. There is a growing interest on the industries part respecting research as is evidenced by various

independent laboratories. Chambers of commerce in lumber producing centers have actively participated with the National Chamber in urging upon the public and industry alike need for broad investigations.

An almost untouched field in Oregon lies in the proper employment of hemlock. We feel that it makes an excellent interior finish. It may be kiln dried down to an amazingly low weight. It makes good pulp material. Yet we find it selling at about one-third the stumpage price of Douglas Fir. Even Douglas Fir is suffering for want of knowledge of its fullest uses.

Now, as new uses are found, broader markets become available which encourage every branch of the industry. It is the right way to take up the stock. Some have said we will have less and less use for lumber therefore why worry about it at all. But the constructive way of thinking is this: we have a natural resource to be grown upon a vast empire fit for growing nothing else; we need the revenue to be derived from these lands; the produce should be usable; let us find its every use, keep constantly and aggressively at it and build for permanency.

Lack of coordination of sales and distribution constantly upset profitable marketing. It is a pure case of production without respect to marketability of product. Over production of certain commodities at one mill and others at a second mill without control

of outlet has led to a dumping process. Thus, within the week, one of Portland's mills, oversupplied with certain finish materials drops its price ten percent and better under an already demoralizing figure, to the distress of plants holding only an ordinary supply of these same items.

Large shipment of lumber unsold to Atlantic Coast market disrupts values. If there is no ready demand upon arrival, it is auctioned off to or dumped upon an over supplied market. Because of its bulkiness, lumber cannot be stored like wheat and hence it must reach its destination as quickly as possible after leaving the source of production.

While much has been said to the effect that chain buying through professional buyers has tended to beat down prices, this is questionable as a national issue because of its limitations. Promiscuous shopping and organized beating down of prices is an old game which acts two ways depending upon rising or dropping markets.

The small mill has been a thorn in the flesh of the large mill. Hopping up small blocks of timber, buying stumpage at a low figure, with no large overhead, and with little opportunity for lumber remanufacture at the plant, they convert their products into cash at low figures, and like the Arab gather their plant in the night and move to new fields or out of the picture entirely, only to be supplanted by other Arabs. The idea of permanent forests for continued use is not theirs. While there is room for the small

operator under sustained yield in small zones, he is a great market disturber under the present order of things. The southern situation is an excellent example, for there he is unloading southern yellow pine at \$18.00 for No. 2 and lower and at \$30.00 for 40 per cent No. 1 common and better. They are in a primary market to which we must ship our products with a freight cost alone almost equal to the full price asked. An advance has been made through chain organization and ownership of small mills, shipping the output to planing mills for re-sorting, remanufacture and subsequent marketing. Milling-in-transit rates have made this a possibility. But until mopping processes are supplanted with orderly cutting in accordance with growing capacity, we shall continue to have this inconsistent and disturbing form of competition. It does not take much to run a seller's market into a buyer's market when dealing with lumber.

Improper financing and liquidating influences have pyramided the situation. I think this the most vicious single item in the entire lumber set-up and it is dealt with later in greater detail. If you are liquidating, you manufacture and dispose of your product without regard to market conditions. Generally speaking the industry as organized to-day is upon a liquidation basis. Consequently the market is materially affected. Improper financing is evidenced when pressure for continuous manufacturing exceeds capacity to carry and store surplus stocks. It may be temporary or it may be

deeply imbedded in an entire industrial structure. In this case the latter is true, as we shall see through the treatment of each of the subsequent heads.

The new order of things in transportation has upset selling practice. To-day you may freight lumber by rail to Chicago in eight days or to New York in fourteen days. This is quite a decided contrast over the month and two month deliveries of the past. In the old days, the tramp steamer carried full cargoes to one or two points where it was received by the wholesaler and re-delivered to many other points. But now, we have as many as fifty established routes with many points of call at regular intervals and by means of fast ships working on schedule. Full cargoes of lumber are supplanted by parcel deliveries, a small jag of lumber constituting only one portion of the total cargo. The consequence is that western mills are more and more being driven to carry the retail stock, instead of eastern yards, thereby increasing plant investment, stock on hand and financial requirements. There could be no objection provided the mills charged for the service. This new order of things in transportation has placed the producer closer to the consumer and therefore more subject to seasonal demand. It is a condition he must accept. His ability to meet it will be controlled by his financial capacity to carry stocks. Those improperly financed find it difficult to meet seasonal requirements. To shut down may spell disaster and to run means accumulation.

of stocks. The inadequately financed are, as a result, forcing a buyers market when logically it should be a seller's market. The financial necessity of a few is forcing all operators to employ cut-throat methods.

A disturbing element is foreign competition. Cedar and fir from British Columbia comprise about 15 per cent of all lumber delivered to the Atlantic Coast. They have a freight advantage of from \$1.00 to \$1.50 per thousand board feet. They also have the advantage of cheap foreign labor. As a result, they are able to deliver lumber in their bottoms to one of our largest markets at a lower figure than we are doing. This fifteen per cent supply is enough to upset any market and especially when our own production exceeds domestic demand plus anticipated foreign consumption of our excess. Our interior markets are also affected because British Columbia timber finds its way into central, northern and prairie states by rail. Foreign pulp and paper is shipped to every part of the United States, even to the Pacific Coast, even to Portland. One of the most difficult thrusts to cope with is that from Soviet Russia. Faced with the necessity of securing cash for the purchase of machinery for her industrialization program and having no exportable surpluses of any moment in the war ~~era~~ and minerals, she has been driven to extremities. She owns extensive areas of timber in Europe and Asia. Without regard to stumpage value, to sustained yield and to the future of these forests, she

has launched a program of exploitation, dumping her lumber on world markets and the resultant flood has brought ruinous competition upon the lumber producing centers of Europe and America. Once a lucrative field, Japan has, through monopolies in Siberia and through tariffs against our finished product, turned tables. She has always been a heavy timber producer on her own account, and because of her large and growing population, required more than she could produce on a perpetual basis. She bought our inexpensive but excellent lumber. Then came a change in her economic structure. The war left her well industrialized with an army of comparatively well trained laborers. The problem was to put them to work. Russian need of cash and proximity of Siberian Kedar gave her the opening. She bought this stumpage through concessions at a low figure and on easy terms, set up more mills and remanufacturing plants and put her people to work. Then she was in a position to say to us, "we will take your logs and cants with little restriction but if you would ship us finished material you must do so over our protective tariff wall which we now set up to shield our own infant industries." It was not retaliation but protection pure and simple. We taught her how to do it well. Furthermore, she is able to ship her Kedar (white pine) in oversizes by her own ships to our prime domestic markets at prices below our cost. Foreign competition has become a decidedly disturbing element.

Through the greater employment of substitutes, lumber's per

capita use has fallen almost fifty per cent according to certain statisticians. Whether the figure is accurate or not, matters very little. The fact is that lumber consumption has not kept up with national growth. As our country ages, building requirements change. New types of construction appear. Urban growth has brought congestion and consequent demand for multiple abodes under one roof such as the apartment house and hotel where thousands of families take up yeararound residence. Thus we have wood replaced by concrete, brick and steel. The age of railroad expansion on a broad scale has passed and some roads have been discontinued. Wooden box cars, flat cars and coaches have been replaced by steel. The automobile whether passenger or truck has changed our method of transportation and consequently metal carriers displace wood and paved highways take the place of ties. This is to be expected. Nevertheless, many substitutes have crept in purely through lack of aggression in opening up new fields for use and disposal and in meeting the opposing interests in legitimate old fields. Substitute people have spent millions where lumber people have spent thousands. Substitute people have gone into lumber yards and the retail lumber dealer is no longer a lumber salesman but a cement, brick and steel order taker, again following the line of least resistance. The work of selling has been done for him by the manufacturer of substitutes.

There is no one remedy for the marketing situation. Some

improvements lie in better advertising, public education, well directed research, aggressive salesmanship and better financing. The tariff would at least be a great lift over the discouraging bumps of the present. But there are many leaders in national politics who say to shut out imported lumber will surely accelerate the progress of forest denudation. There are just as many others who hold that ruinous competition forces depletion of standing stocks and liquidation of the industry. The tariff is needed when dealing with a situation like to-day's with lumber pouring in from British Columbia and Siberia at prices considerably below our market which market is below cost of production.

Production with respect to marketability of product is necessary. Production and price control through collective agreement or mergers has received attention. There is a marked and not to be denied demand for the early establishment of orderly means of industrial self control. It is estimated that \$150,000,000 in added capital will be necessary for operating funds without consideration of increased production or increased facilities for production. This is only to remove the pressure of over-capitalized raw-material.

Zoning timbered areas and operating on a sustained yield basis to a very large extent will automatically and intelligently control our raw supply. Without this, we still will have new and old independent mills adding to supply whenever demand entices, re-

ardless of attempts at control of the manufactured product. So we are forced to look back through the other departments of forestry right to the soil, the source of the forest, just as the grain business has had to go for a clearer understanding and more complete solution. Other measures will materially assist, but in the final analysis the case of overproduction is in the hands of the tree farmer more than in any other person's hands.

CHAPTER V

REMANUFACTURE

Remanufacture has to do with conversion of the raw product into its finer uses. It is the bakery shop of the forest industry. It takes rough lumber or pulp or sawdust and converts it into final or semi-final shape.

To find profitable use for all our forest production is the ideal. While we may not attain it, certainly it is practical to strive toward it. Changing requirements of society will always control. What was desirable yesterday, becomes common today and fades into obsolescence tomorrow. Transitional processes are always upon us. He who stands still and entrenches himself, on the ground that what was will always be, fights a losing battle. He who recognizes that time waits for no man and who girds and arms himself for a constructively aggressive battle, carries on.

In reaching the ideal, each step must show that it pays now or in the future. True, trial by error is necessary. But in venturing forth let us ask this question, "will it pay?" It is the acid test.

For years we have been interested in our raw lumber. We have been shipping out of Oregon vast quantities of raw product without much thought of ultimate use or the significance of changing times

or the influence of remanufacture at home upon upbuilding the state. We have been asleep upon our two by fours.

The lumberman has been limited however by economic conditions. Not only has he had to deal with lethargy but also with the changing character of his available raw supply. As Durkee well says, "the lumberman must take his logs as he finds them, and he is restricted in the nature of the case to the quantity of the several grades of lumber available in the mill, by the size and character of the logs. The production of the upper grades of lumber tends to decrease, and the lower grades to increase, as the choicest timber is cut away. The price of clear lumber is proportionate to its scarcity, so that recourse must be had more and more to the lower grades for manufacture of price controlled commodities." One of the controlling factors is sustained yield, but that cannot stand by itself. Broad use of all products plus profit are essential.

We do note a well defined effort on the part of a few to arrive at a constantly higher plane in the face of liquidation possibilities. Large mills have long since put in their dry kilns and planing mills so as to broaden their list of products. Many small mills have installed planers or have grouped together and shipped their uppers to one plant under milling in transit privileges. Thus a greater variety of products are being turned out at home. They have been adding bolt machines for lath and small squares, to take out of the slab that which is good.

In order profitably to smoothe and fashion lumber we must season properly. Air seasoning though slow is broadly practiced. There is much unnecessary waste and degrade through checking, warping and blue staining. "While it is obviously not possible to vary the climatic conditions to which the stock is exposed, it is possible to control the extent to which these climatic conditions affect the stock by varying such factors as the size and shape of the lumber pile." "The need for kiln drying arises from two main requirements. One is economic--to reduce freight cost; to reduce the quantities of lumber held and hence the investment; to reduce losses; and to fill orders on short notice. The other is physical--the necessity of having lumber drier than can be obtained by air seasoning in regions where the products are used in heated houses. For such regions and purposes lumber must of necessity be kiln dired even if it is first air dired."

While it is desirable to employ this step to remanufacture, costs and waste are yet obstacles to profit. Even in some of the best appointed mills, there is an eighteen per cent waste and a seven per cent degrade or a total material loss of twenty five per cent. Add this to the average five dollar planer cost, and the total of the two often exceeds the difference between the raw and finished products, even with benefit of rail freight saving through lighter weights. Water shipments are not predicated upon weight but upon cubic content. As an example, 1 x 6 clear rough green

sold for \$32.50 per thousand while 1 x 6 siding, kiln dried, sold for \$34.00. Why convert? As we step into finer uses, however, the loss becomes less noticeable. It is probably a good thing that siding is not the only item on the remanufactured list.

Better drying practice and broader uses of lumber are inseparable in the scheme of success. In air drying there is need of extended research in control, housing and the like. Finance raises its head in the need of capital investment for the purpose of holding sufficient stock for a suitable time, in providing adequate land space and dry sheds to say nothing of bearing insurance costs. Management of the dry kiln is an art in which experts are needed to produce a profit. It goes beyond the kiln for there must be knowledge of the properties of different woods and of the ultimate use to which they are to be put.

Much is being accomplished through research. Probably the two most outstanding institutions carrying on this work are the Oregon Agricultural College and Syracuse University. Adequate kilns and equipment standards are being worked out as well as individual schedules and methods of handling. These institutions are providing men with technical training to handle the seasoning jobs and are offering short courses to others who may not attend the full course. Fully equipped modern plants are at the schools and as a result practical experience may be gained and experiments conducted.

One might inquire as to the field for remanufacture of lumber.

Let us briefly glance over some of the items. They are arms, backing, balusters, blinds, blocks, boards (auto, floor etc.), box or crate material, brackets, cants, casings, core stock, columns, cross arms, doors and door stock, inside finishing, flooring, frames (door, screen and window) guttering, handles, ladder material, lath, logs, match stock, material for silo, tank and wood pipes, panels, pickets, pins, pipes, pipe casings, plywood, posts, rails, rollers, sash, stairwork, staves and heading, ties, troughs, tubing, veneering, and wedges. Then there is furniture. Toys also are a factor.

With this great field opening up, more attention is being given to a greater variety of unit machines in the planing mill. There is an excessive waste in trimmings and short lengths. The lumberman continues to ship in long lengths because we have educated buyers in terms of long lengths. One or two operators are specializing in cutting to exact lengths, protecting ends in shipment and thus encouraging users to drop away from purchasing longs. This is a step forward. Department stores now have their lumber room from which sales are made in various lengths. As a matter of fact the final use of short lumber is much greater than long and it is easier to get, especially in the higher grades. Labor enters as an item in the employment of shorts to any great extent, but this may be largely overcome through efficiency in cutting and laying. One of the interesting developments has been the furniture plant using waste mill ends for standardized drawers, tables and stands.

We are tardy in developing sash and screen plants. Furniture and furniture parts are being brought in from other parts of the United States, made out of Oregon lumber. We pay a double freight bill, one sending stuff out including freight on the usable part as well as upon the waste, and one bringing the finished product back. There is a wide field for veneers possible of economic manufacture in Oregon. By virtue of our raw supply, excellent shipping facilities, broad list of usable native trees, opportunities for importation of mahoganies, oak, walnut and other valuable species not found here in commercial quantities, superior labor conditions, there is much truth in the assertion that there is a bright future ahead if we will only prepare for it in time.

Wood fabrication is making forward strides. By reducing the original piece of lumber to fibers, we may reconstruct it again into boards of various densities and sizes to meet new and varied uses. One method is to chip the wood, explode the chips under high steam pressure and float out the fibers. Then by pressing and moulding, bring it back to boards again. This product consists entirely of long cellulose fibre, unimpaired in strength and retaining the lignine. It is merely a process of tearing apart and putting together again. The resultant material combines structure and insulation to a degree heretofore difficult to find. It also affords employment of wood now finding a lower use and if wisely handled will remove the market of a considerable quantity of low

grade lumber through cutting out the unusable defects and chipping the residue.

An Australian process has been developed for making combination structural and insulating board out of sawdust or wood waste in combination with casein and a chemical, the exact chemical being a secret. The resulting product is hard, fairly light, seems to possess great rigidity and moderate strength. It may be machined just as wood is machined, that is, converted into floorings mouldings and the like. It is waterproof, fire resistant and acid resistant. It can be made insect proof. At the time of manufacture, dyes may be added to secure any color desired. This coloring goes entirely through the board and permanently tints it. It is supposed to have high insulating value. Common wood waste such as hog chips may be used. Samples made of Douglas Fir chips were very beautiful.

The most effective use of wood presupposes a thorough knowledge of its chemical composition. Even though research has but scratched the surface, an amazing array of new materials has come forth. Through the study of wood by colloid-chemical methods, we are beginning to discover the broad differences in properties, appearance and utility.

Demand for pulp products has made us scour the territory for raw materials close to plant. Creeping into this raw material supply is mill waste supply. Thus we come into another utilization

which steps up remanufacture. Barking and the new chipping process have made possible shipment of hemlock waste and low grade commons from inland mills to pulp mills one hundred and fifty miles distant. Now hemlock timber has been hard to sell, hemlock lumber has been limited in use of lower grades and hence it has not been broadly used although the territory contains extensive stands of mature trees. The young trees may economically be converted into pulp, those for instance forty years old and less. But when maturity of say sixty five years is reached it is waste to convert good lumber produced that age to pulp. The secret would appear to be now to cut the log into lumber, select the uppers for lighter uses and convert the lowers into pulp. Paper bags are replacing Hessian cloth and cotton in many cases. Craft paper has a large field. We find an increasing use for pulp products not only in quantity but also in kind. "At present the only reliable method of determining the paper making values of pulps is by actually making them into paper. The development of simple, easily applied tests should be attempted through work on the chemical and physical properties of pulps." There is some indication that congress will appropriate money for the purpose of investigating the use of Pacific Northwest woods in the manufacture of pulp and it is to be hoped that this may be the fore-runner of a deeper study such as that quoted above.

Balsam-wool, rayon, cellophane, sausage casings and composition

products are physical evidences of the course we may sail in the future through a better knowledge of wood properties. Except for our southern naval store industry, little is being done in extractives. Extractives find their way into vegetable dyes, soaps, varnish, printers' ink, etc., but extensive research in this field is needed. Then we have the distillation products, derived through destructive or steam processes. From these we get wood alcohol, acetate of lime, charcoal, tar, flotation oils, wood preservatives, transformer oils, wood pitch, etc. Hydrolysis appears to be opening up a greater recovery of ethyl alcohol. These factors are mentioned as indications for the future and as worthy of research for the promotion of wood utilization through remanufacture. This could be extended into a discussion of other uses such as in compounds, but there are many who have dug into this so thoroughly and it would only serve to emphasize a little more what has already been stressed so much. Changing times and ultimate use are forcing us to broaden our field.

Aside from the direct benefit to permanency, there is an indirect benefit to the industry which is of tremendous importance to the commercial advancement of Oregon. That is remanufacture at home. The figures given are for comparison only, but they will serve to illustrate the point. The approximate ratio of man employed per thousand feet giving the logging camp as one, is as follows; sawmill one, pulp and paper from four to eight, furniture

plant from five to twenty and so on. There is no average available for employment in remanufacture. But suppose we take five as the ratio, and that would be conservative, then for every million feet produced in the mills, we would employ 1000 men in the camp, plus 1000 men in the mill, plus 5000 men in remanufacture. It may go, without further expansion of the subject, that it would be well for lumber manufacturing cities to study the field, learn what may be profitably started on a reasonably permanent basis and invite capital to enter. Chambers of commerce in co-operation with industry and research agencies may do much. Certainly by greater refinement at home we build for greater use of all our lumber products by developing our own primary markets. This rotates around the many arcs in permanency's circle.

Some say that re-manufacture is the key to the situation. Is it? It appears to be essential and fundamental. We have seen the importance of marketing and some say that is the root of the trouble. Now for diversion let us look at manufacturing.

CHAPTER VI

MANUFACTURE

Wood manufacture contemplates tree reduction to use such as rough lumber, shingles, pulp, fuel wood and sawdust.

Formerly, the sawmill operator, with a broad spread between log costs and lumber sale values, was able to profit under normal conditions. His supply of logs lay near primary markets. Forests were easily accessible. Stumpage was low. Therefore log cost at the mill was low. As virgin timber has been removed from river's edge, long and expensive log haul has been incurred. Stumpage cost itself is greater. Plant equipment and labor cost likewise have increased.

While origination charges move up, competition with fellow liquidators and with substitutes press net receipts down. Because of liquidation, depreciation charges are heavier. Life of plant is measured by two factors--anticipation of date of permanent closing and by actual wear and tear. Whenever dependable log supply ends, the mill is junked, because its parts, still usable at point of installation, are of little value if torn down, shipped to and re-assembled at another point. It is for this reason that depreciation charges under short time operation exceed those under long time operation. This excess must be borne by current production,

which shortens the margin between sale and cost.

The lumber industry must predicate profits on sixty or seventy per cent of the amount which would be cut under what has been normal operating conditions, not upon full production if it would arrive at true costs. While certain weighted charges would increase, nevertheless curtailment of over-supply would tend toward an upward move in the price of finished product. There is precedent for this procedure in the steel industry which predicates its profits on sixty per cent operating costs.

Wages will have to be adjusted to the operating cost. In fact, the effect upon labor will be more far reaching than is fully understood. Already paid a low scale, curtailment means reduction in annual income for a proportion of the employees through intermittent employment. One partial remedy would lie in setting up a base scale of wage for each type of work in manufacture, allowing percentage increases in proportion to sales value increases and deducting percentage decreases in proportion to sales value decreases based upon monthly or semi-monthly averages. We may even consider advisability of checking this against volume production. However complicated this may seem, the steel industry attempts to adjust wages to earning capacity, shutting down when decreases bring the actual wage schedule below an agreed upon minimum.

What effect this will have upon labor turn-over is not known.

If controlled production brings materially increased return, then positions will be cherished. Otherwise not. Is labor turn-over a factor in operation cost? I have checked the employment record for one of Oregon's largest and most successful operations and I find an astonishing gross annual turn over. On an average of 320 man jobs per month, 361 men per month were employed of whom 41 quit. In the course of one year 492 men quit on this average of 320 man jobs making the annual labor turn-over 154 per cent. Most of this transient employment falls in the unskilled labor class, which is a fortunate misfortune for the industry. Some have tried to estimate the turn-over cost but that is a guess at best. But it costs something and therefore is a waste and that waste is not only visited upon the industry but also upon other industries and upon all society.

We may rectify the situation in part but not entirely. Man is by nature a transient creature. American traditions encourage his natural aspiration to climb into actual accomplishment. If we deal with averages, however, we meet a situation that may be partially rectified. Two channels are open--one through increased family wage and the other through dual occupations. The first contemplates employment for more than one member of the family and is only a temporary expedient because one or the other family member eventually splits off. The second contemplates employment at the major position with fill-in opportunities during shut down

periods, and is a more permanent form of adjustment because family entity is maintainable to a larger degree. There are many ramifications to be considered, but the above outlines essentials sufficient to indicate the course we probably will sail on our way toward permanency.

In order to make reduction in operating schedules feasible, some offset is required to maintain over-head. The unit mill has been given consideration. Instead of one mill cutting three hundred thousand feet we would have, for example, three mills each cutting one hundred thousand feet either arranged in a battery or at three strategical points possible of economic unified management. In case of curtailment one or two sides could be shut down without completely closing down the plant. This method makes possible holding together skeleton crews, thus limiting labor turn-over. Such a plant lends flexibility to operation through ease in repairs. Millwrights may shift from one unit to another without complete shut down. In the future, as we get into small timber, this move seems inevitable, but there are objections to it today. Because of large timbers, a heavy head rig is necessary and one heavy head rig can handle upwards of 300,000 feet in eight hours when cutting large stuff. If increased by three, the rest of the plant would be either swamped or multiplied by three. Available supply of logs also is a controlling factor. What invention or changed application of present known machinery may do

is a gamble.

Mills should be located and capacity gauged with respect to availability of permanent supply of logs and to marketing all its products. This leads to permanent communities. Let us presume that we have water and rail facilities coupled with a large primary market at home and have contiguous to it 200,000 acres of Douglas Fir forest type lands with a net growing capacity of 600 log feet per annum per acre, after making due allowance for other destructive agencies. How much lumber cutting capacity may we provide for under present methods? Total annual growing capacity would be 120 million log feet plus ten percent mill over-run for all grades or 132 million feet. Grant a 300 day year and we have a per diem maximum milling capacity of 440,000 feet. In Oregon we have the fog belt with increased growing capacity on comparable lands and we have the pine belt with decreased growing capacity under a broad variation of conditions. If we cut less, we back up mill costs upon forest costs. While the ideal may not be reached it is worth striving for.

Large operations should contemplate secondary mills either in the logging camp or alongside the major mill, whichever is more profitable, for the manufacture of cull logs or small timber. This utilizes waste and relieves the major mill materially by adaptation. The Linnton, Oregon situation is unusually pertinent. Here we have several sources of logs, bringing into booms yellow

fir, red fir, cull and small fir timber and cedar. Yellow fir goes to the West Oregon Lumber Company for lumber manufacture and to the Portland Manufacturing Company as peeler stock. Red fir down to 16 inches goes to the Clark and Wilson major mill. Cull logs go to the Johnson Lumber Company. Small logs (16 inches and less) go to the Clark and Wilson minor mill or the Rieg plant. Cedar goes to the Clark and Wilson shingle mill or to the Roles Shingle Mill. Each plant serves a special purpose and each relieves the other. Small and cull logs slow down major operations and increase cost per thousand feet of production. In the past, these logs were left in the woods as waste if this "slow-down" was too serious. Now economic use is being found for them. This would not be entirely feasible in areas remote from Portland, because waste would not be as profitably disposable. In Portland it is in great demand in the form of sawdust, slabs and hog fuel. Because of primary market and remanufacturing, we may more easily dispose of low grades and small dimensions, which condition encourages closer cutting. Home consumption plus shipping facilities mean something for permanency.

Another constructive co-ordination of industries is found at St. Helens. Here we have saw mills producing lumber and turning "waste" over to pulp mills and other products which might go into low use ordinarily over to plywood and lumber refabrication plants. The pulp plants are bringing cord stock from the mills which other-

wise would be a loss. Paper mills have sprung up. This may prove a more complete answer than Linnton's.

Efficiency in mechanical design, yarding and loading are receiving closer attention. The swift change from man to machine handling has required extensive changes in equipment and alignment. Capacity measured in ratio of thousand feet produced per man is closely checked against machine operating costs and plant investment. As lumber production per man employed increases, plant costs increase and number of men decreases. To find the balance between machine and labor is an ever present problem. Some failures may be attributed to over-machine-equipped plants and on the other hand to over-manned plants.

As machinery replaces man we lessen selection. When lumber is cheap, this matters not so much as when dear. Man increases selectability. As uses for various grades of wood are found there is greater call for sorting. This a machine can not do. Silk is one thing, lumber another. The Swedish gang saw immediately reduces the log to various parts regardless of kind or quality. It saves in saw kerf. The American headrig opens up the log, permits man to determine its quality and ultimate use and then turns the cants or planks over to gangs for sorted and measured reduction rather than for standardized sizes. With all the hue and cry for speeding up production, we find the wise manufacturer studying its effect upon quality of turnout and synchronization. If we crowd lumber through machines too rapidly, we sacrifice accuracy, damage

quality and increase waste. We also shorten machine lift. The biggest item comes in delays to the entire plant caused by break down of key-position high speed units. Because crowding machines to the limit has not paid, progressive owners are slowing down speed. While speed is a factor, continuous run is more important. If a mill is not properly synchronized it is not functioning efficiently. There is little sense in increasing head-rig capacity without ways and means of getting lumber through the rest of the mill and off the chains into the yard. I have checked one of Oregon's largest operations and find that they are limited to fifty per cent cutting capacity by this error in construction. If you have a fast machine in the middle of your mill and slow ones on either side, you have an unbalanced plant. Control lies in synchronizing the entire course of the log from boom to yard.

Displacement of labor by machinery eventually influences cost of living which reaches back to wages paid. It is a factor in the economic scheme of things. Pressure from this direction increases as opportunity for profitable employment decreases.

Waste and low valued products form by all odds the greatest proportion of the tree when reduced to its parts. While broader use is coming, the greatest good will come from increasing the field for higher use. For comparison only, I present the following tables prepared by The National Association of Wood-Using Industries.

Tops, limbs and stumps	16.6%
Bark	10.9
Sawkerf	10.9
Slabs	10.0
Edgings and Trimmings	10.0
Miscellaneous	2.5
Seasoning	5.6
Lumber	
Waste	16.3
Clear Cuttings	<u>17.2</u>
Total	100.0%

Translated, this signified that only 17.2% of the tree reaches a high use and the remainder lies in low use or almost total waste.

The association also sets up the following based upon hypothetical fullest use:

Stump	5%
Seasoning	3
Clear Dimension Stock	25
Available for Pulp or	
Distillation	<u>67</u>
Total	100%

This indicates possibilities in the industry. Through research, better milling practice, greater remanufacturing opportunities and aggressive marketing we bring the practical closer to the ideal. The above table points out ultimate bulk employment of

Product. Although incomplete, the following table shows some itemized possible avenues of ultimate use.

Pulp and Chemical Products Derived from Wood

Recknagel and Spring in "Forestry"

1. Mechanical Means

Ground Wood

Box Board

Newsprint and Wood Containing Papers

Wood Flour

With Nitroglycerine and Saltpetric--Dynamite

2. Chemical Means

With Mureatic Acid and Micro-organisms

Glucose

Alcohol

3. Mechanical Disintegration

Wood Chips

1. With Chlorine--Wood pulp.

2. With Sulfurous Soda--Sulfate Cellulose

a. Kraft Paper

b. Waxed and Parchment Paper

c. Writing--print--Book--Sacks and other papers.

3. With Caustic Soda

a. Soda Pulp

Printing Paper

Writing--Print--Book--Sacks and other papers

4. With Calcium Bi Sulfite--Sulfite Pulp

- a. News Print and Wood containing papers.
- b. Kraft paper--waxed and Parchment Paper.
- c. Writing--Print--Book--Sacks and other papers.
- d. With Ammonia--Copper Oxide--Copper Silk Textile.
- e. Utilization of Waste Lye

Alcohol activated carbon and adhesives.

With acetic Acid--Acetate cellulose

Aeroplane and other parts

Unbreakable glass

By chemical means

Varnish

Non-inflammable films.

Acetate Silk (Dreyfuss Silk)

Textiles

Insulators

f. With Na OH and Carbon Disulfite--Viscose

Artificial Horse-hair

Cellophane

Viscose Silk (Rayon)

Textiles

Sizing

Sausage Casings

5. With Sulphur and Nitric Acid--Nitrate of Cellulose
 - a. With Organic Solvents and Pigments--Pyroxylin
(Duco) Striping colors.
 - b. Artificial Leather
 - c. With Camphor--Celluloid
 - d. With Nitroglycerin--Cordite
 - e. Photographic Films
 - f. Smokeless powder and explosives
 - g. With Alkali--Sulfide--Chardonnat Silk Textiles

So, as we progress, we grow farther away from the conversion of all usable wood in a tree into lumber. Likewise we grow farther away from converting it all into pulp. We are well along the way toward employment of wood in multiple and proper uses. Economic necessity is driving us and knowledge is showing us along the road to permanency.

As we approach permanency, depreciation schedules, (the despair of accountants and the ruination of many operators), are more and more spread out. The more extended that period becomes, the less the burden upon current operations. Lumber accountants readily agree as to the effect this will have upon annual earnings reports.

Is it not a problem? Now which will you say is at the root of the situation, marketing, remanufacture or manufacture? Are they not all interwoven?

to here

CHAPTER VII

LOGGING

Logging, in its broadest application, takes into account both silvicultural requirements of forest and better utilization of crop. It is harvesting and when considered in its highest form contemplates not only the present but also the future yield from the soil.

Not so many years ago, we logged by oxen. Our forests were near the major water-ways. We could pick the easiest show, speed was not a factor.

Time has changed the old order of things. Today we use power in the form of machinery. We are more remote from the rivers and long haul problems confront us. It is the age of speed and dispatch. Economy of time and movement are essential. Still we are in the pioneering stages.

Logging is now recognized as an engineering problem of the highest order. It is no longer a matter of selecting the best fighter in camp to head the crew. Brains, knowledge of forestry, training in engineering and practicability in application are all essential. A superintendent must be able to adapt himself to ever changing conditions. There are no hard fast rules of thumb by which he may guide his company. We find that engineering problems include not only ordinary surveying but also topographic matters, road and bridge construction and mechanics of the most intricate

and difficult nature. Very few men are fully qualified to assume the responsibility of such undertaking. Able men are in high demand because profit or loss lies very largely within the province of the logging engineer.

One might be inclined to minimize the importance of a few cents in either direction. For example, let us assume that the variation is fifty cents per thousand. In a major operation of 120,000,000 feet per year fifty cents a thousand amounts to sixty thousand dollars. A comparison of different logging operations reveals that the variation is much greater than this, in some cases running up as much as two and three dollars per thousand and sometimes more. This is true even where the finest equipment is employed. When this variation appears in comparable areas and under similar ground and growth conditions, owners are unanimous in stating that personnel plays a leading role. Logging, is an engineering problem.

Of old, when estimating cruises were made, topography of the land was sketched in by guess. While it gave a general picture of the operating zone, it was not thoroughly dependable. Many operators bought on the strength of these sketches only to find themselves later confronted with almost insurmountable barriers. Take the case of a sugar pine operator in Northern California who invested very heavily in the anticipation that he could easily reach a belt of over one billion feet of excellent timber. When he extended his rail lines through a small part of this timber, he was

astonished to find that he had headed up in a canyon out of which there was no possible way to load his railroad over the hump into the more desired and most extensive stand. His consequent losses were tremendous. This has happened so many times throughout the West, that operators now are giving close attention to accurate topographic surveys. Practically all operators of any size do this along with the original cruise at but a nominal added cost.

Formerly, cruising was largely a matter of estimating. It was the case of whose guess was best, the vendor's or the vendee's. There were no volume tables to guide as to gross contents. Estimators did not have an accurate knowledge of what was within the tree. Today we have men of experience, knowledge, backed up by the results of research who are able to go through a forest and check within a very close margin the present employed footage. Volume tables and calipering give gross contents. Exterior defects, exposures and the like, indicate the quality of the tree. His cruise shows in itemized form the true character of each small subdivision. We find that in the same cruiser there is a decided improvement in his methods. To illustrate, fifteen years ago a cruiser estimated a stand in a certain area. He was called upon to go through this same district recently. His revised figures show a variation of over 20 per cent and the revised figures, compiled under scientific methods, are checking

out with actual production.

Main line railroads were formerly laid out without due consideration to grades, adverse grades, curves and compensation of curves. Many outfits have been slow to change so as to meet the losses resulting from defective road construction. But the aggressive owner is putting in better roads with resultant less depreciation, maintenance and delay. In fact, by proper road construction, with due consideration to grades, curves and ballasting, long haul operations are being conducted at a lower figure than the old short haul operation. Furthermore, the owner is able to capitalize for permanency under scientific road construction, is in a position to consider his main line as a part of his capitalization and may spread his depreciation charges over a much longer period. Thus, in two ways we are building for permanency, actual saving in haul, and relief of excessive charges from current operations, and as permanency becomes more and more a recognized part of any industry, those same charges become lighter and lighter, all leading to actual profit and hence to permanency.

While long haul costs have shown a decidedly down hill tendency under capable management and intelligent financing, there is a decidedly noticeable variation in all operations in spur line and show phases. There are two temptations, one to build railroads and the other to log clean, particularly, in the Douglas Fir region. There is something about building railroads which intrigues even a very sensible logger. To my way of thinking, psychology

plays a bigger part than commonsense. The impulse to run a spur line into every pocket of timber is so prevalent that great losses are incurred. Here it is where your engineer should take hold. He must be able to finely balance his judgment so as to determine which is the best way to open up a stand and when to build and when not to build. In a great many cases, cold-decking is advisable rather than additional spur line. By tandem donkey engine delivery of logs to the spur, we are able to overcome excessive spur costs in many instances. Perhaps back of this temptation referred to is an old influence brought about by fire hazards under former operating equipment. The old donkey engine, run by steam and using either crude oil or wood, mostly the latter, was a fire monaco. Furthermore, it was necessary to run water by pipe to these out-lying relay donkeys at considerable expense. But this has been overcome through modern developments. The gas burning donkey has evidently come to stay. Gas burning makes it safer, there is no water problem and it is more flexible. Even in the laying out of spur lines, the right-of-way donkeys today are using gas instead of steam. Any one who has fired a right-of-way donkey under old methods knows what a nuisance steam is to say nothing of the expense and where you have a nuisance, you have a breakdown of morale. When morale breaks down expense goes up.

The other temptation, that of logging everything in sight has been costly. In many cases it is advisable to pass up an entire

block of timber. Here again the scientific engineer, he who knows how to compute costs and can couple this with an understanding of silvicultural conditions, is needed. It may be that, even though the cost of logging a block would be excessive, it would be well to log it any way because of wind throw possibilities and consequent added fire risk.

Logging equipment should be sufficiently heavy to handle all commercial timber in the operating zone. Light equipment is a greater mistake in heavy timber than heavy equipment in small stuff. Synchronized operations are dependent upon a well balanced lay out.

Considerable criticism has been directed toward high lead and its wastefulness. Under present conditions I can not say how we may materially change in the Douglas Fir region. The caterpillar may be a remedy, but certainly there must be extensive research in this direction before any conclusion can be definitely reached. Rough lands and excessive moisture conditions are as yet not in favor of the caterpillar. Introduction of yarders has been found practical in medium sized timber. There is no particular advantage gained in large sized timber. The yarder is faster because it can carry three or four logs to the cold-deck at one time. There is less breakage and visibility is better. There is less wear and tear on tackle and the machine itself lasts longer. Furthermore, one set up will go much farther. It is more flexible in that changing the far end spar is comparatively simple. There is greater safety fewer logs are hooked around stumps.

Yarders are expensive, far more so than other unit types. This added investment is a charge against operations. Unless used to capacity, fullest realization is not obtained and if improperly used losses result. This use largely depends upon supervision. There is little sense in hooking on one log per trip when three logs could be handled. Man, not machine, has the power of selection.

Rolling stock depends upon lay of land, character of stand and trade catered to. Again there are no hard and fast rules. Adaptability counts most. Rail trucks afford cheaper operation than cars, but cars save spilling. The rougher your country, the more spilling there is. Generally speaking, long or variable length loads are more cheaply handled on rail trucks, and short length loads are suited better to cars. If logs are being supplied mills for water and rail trade, then long or variable logs are best. If logs are being converted into rail trade stock principally, then short logs are in demand. Costs of bucking in the woods are being reduced by hauling out long lengths. In fact the longer the piece you take out, the less handling there is all around. Also, you may economically remove more of the tree for market, hence less waste. The longer the log in the mill pond, the greater the selectivity for special uses. This phase forms one of the retaining walls along our road to permanency.

Selective logging is being given close attention. At first

it was argued for very largely upon the basis of theory. Practice is showing us some of its advantages. David I. Mason says "Selective logging consists, in a given operation, in determining which timber should be removed and which should not be removed, and then in logging the kinds of timber determined upon for removal." In his discussion he points out that "several different kinds of selective logging may be distinguished." There is selection of younger, thrifty trees and the seed trees to be reserved from cutting, remainder to be cut, placing emphasis upon the trees to be reserved for silvicultural more than economic reasons. Second, there is crude selection which aims at improving financial results by leaving material believed to be unprofitable. Third, there is scientific selection through careful determination and analysis of facts concerning a given tract of forest land, and then to select from the many more profitable methods, the most profitable means of utilization and management.

I quite agree with Mr. Mason, in general. We must apply the acid test "Will it pay?" Naturally, this question follows--"What pays?" Are we to consider purely present values and log to these standards? Are we to predicate computations on present or future values or upon a combination of both? True, we cannot accurately measure what forty years hence may have in store for us, but we do know that there is something ahead. Whenever, residual stands or base lands take on present values in contemplation of future yield,

we drive an entering wedge into purely present considerations. As we convert such stands or lands from liabilities or non valued areas into assets possible of evaluation, we definitely affect profit and loss accounts. Future values are therefore a factor and silvicultural considerations should not be minimized.

Pine forests east of the Cascade Mountain summit, lend themselves readily to selective logging. Generally speaking, the ground is not rough, forests are open and stands are accessible. Costs of railroading are low, because main line and spurs may be laid, removed and re-laid easily. Thus an operator may put selection upon a definite rotation basis without undue pressure from natural handicaps. Breakage in felling and yarding is comparatively low because of ground slopes and open stands. This factor alone tends to insure a continuous crop. Fire hazards are low in spite of aridity; aridity proving a protection against fire because there is not sufficient moisture to support rank tree and undergrowth. Logging by caterpillar may largely replace the donkey engine in this region, through low initial cost, low maintenance and extreme flexibility. Permanency in price is not difficult, if owners will cut in keeping with growing capacity.

When we enter the fir forests, we are confronted with an entirely different problem. Lying west of the Cascade summit, they cover extremely rough lands, they are closed and dense and many zones are difficult of access. Undergrowth, fallen trees and

density of stand present almost an impenetrable jungle. Rail costs are high--trestles, bulkheading, filling, grading and ballasting are large items. To return to a unit stand every few years in this era, would be prohibitive in the larger portion of Western Oregon. To take out only mature marketable stuff under present methods means the destruction of a very large amount of highly valuable second growth. In a vast part of Oregon's fir areas is found an excessive amount of over-ripe and decadent timber. As we reach them, we are confronted with a problem decidedly upsetting to permanency. There is little chance for a broad program of selective logging. Because of the amount of unusable material in each tree, forest floor debris is multiplied, thereby increasing fire hazard to young growth. It costs just as much to fell a poor tree as a good one, but the charge against usable material in a poor tree is much heavier than against the usable material in a good one. There seems to be no remedy other than greater use for waste. Clean cutting is resorted to so as to salvage over-ripe timber. Over-ripe stands retard permanency but do not stop it.

Because of density and size of fir stands, selective logging has come into use in a different manner than commonly understood. We think of selective logging as the silvicultural process referred to before, that of selecting only trees ready to market and leaving seed trees and young growth for future rotations. Whenever dense old stands and rough lands present themselves, serious breakage is prevalent. Some are taking out piling, pole and pulp stock

in advance of the major operation at a profit. Present logging practice ruined these small trees anyway. So, why not? It is a case of salvaging by selection. This is feasible, when long haul costs to market do not offset usual low prices for immature growth. Re-logging is also being found profitable when close to manufacturing or consuming points. Broken, inferior or small logs may be cut up into full wood, fence posts or pulp stock. By so doing, a greater amount of debris is removed from the forest floor reducing fire hazard to remaining growth upon the soil and to seeds within the ground. Firms should measure costs of cleaning up the forest floor by salability of debris plus consequent increased value of cut over land plus saving in cost of reforestation and insurance. The more this is recognized and practiced the surer we are of continuous forest crops. The greater use for wood, the greater remanufacturing and manufacturing at home, the greater are the opportunities for profitable disposal of wood waste.

Labor turn-over is growing less serious. There is a marked change in recent years through the upbuilding of permanent communities and construction of good roads and better housing conditions. Still the average turn-over is around twenty per cent per month--loggers are still a nomadic lot. Lack of permanency in camp location, unusual risks and isolation are factors in turn-over. Personnel management is awakening interest in employers. Carrying the cause to the people is awakening interest in employees. There is greater individual responsibility which fosters appreciation

of timber values which builds for stabilized labor conditions.

Improper financing and adversity have led to over-production, dumping logs on the market through inability to store them in the woods or boom. It was thought that the trade-acceptance would provide a means of facilitating orderly distribution. It has not worked out. Grain can be put in elevators but logs are bulky things. Community booms for warehousing may be a way out. Our financing is largely upon a short time basis hinged always upon liquidation. Under sustained yield management, rail and trail costs may be lifted in part from current maintenance; they may be considered in part as fixed capital investments in permanent improvements; relogging costs may be partially charged to current operations as fire protection but should be offset by credits for income from products of relogging, increased values in land and future crops. Permanency cuts down depreciation. Thus we reduce operating costs and weighted carrying charges. Long time financing begins to look more feasible and attractive.

If it were easy, where would incentive be? That we are on the road is sure so let us plod along for the goal is worth reaching.

CHAPTER VIII

TIMBER OWNING--¹FREE FARMING

If we would keep all our forest type lands busy we should grow trees continuously thereon. If we would preserve, build up, and keep our mills going we must have timber supply. Because of the fact that the nation is vitally concerned in growing successive tree crops for human needs, and because abundant forest products are essential for maximum national welfare and prosperity, we know that there is no practical reason why continuous supply may not be achieved ultimately. For, if private capital will not undertake it and if the public suffers then perforce the public must do it. Our chief concern is land use and timber supply.

But there are certain equities to preserve. The right of an individual to own property is undeniable. The right to own grain farms or grazing ranches is just as questionable as the right of an individual to own tree farms. Further, American society has not attempted absolutely to dictate how a man may or may not farm his land, except when his husbandry adversely affects his immediate neighbors temporarily. The time may come when police powers will be broadened so as to compel owners to observe certain fundamentals in husbandry because of the present and future dependence of the populace upon proper land use. In a democracy such as ours, we look upon property, generally, as belonging to the people. The

government is representative in form and exists primarily for the individuals thereof. Although there are instances where collective protection requires governmental ownership, broadly speaking private initiative should be encouraged. It is the very foundation of our American independence and advancement. When economic obstacles arise defeating it, then their removal should be sought. When apparently unremovable and when the public suffers then and then only should the government participate. Such participation should extend only to the insurmountable portion of the problem.

So we come to this matter of private ownership of forest lands. Will it pay? If it pays, we may be sure that private initiative will enter. If it does not pay, then we must either remove obstacles, look for other agencies to undertake ownership or abandon the lands entirely.

If we were dealing with crops requiring but one year to grow, experience shows that private endeavor may be depended upon largely to undertake the task. A farmer or an investor in anything, for that matter, looks to annual return. As immediate or annual return becomes more remote, the field becomes more and more restricted to those individuals or agencies who can finance themselves during the interim. The broader the gap, the greater the problem--the more speculative the undertaking. Uncertainty as to future physical values is always a deterrent. True we have speculated in stocks and bonds--but how many of the intelligentsia buy without a thought

of early return either through reasonable dividends or interest or accretion in capital value? Marketability is determined thereby. Business property may be improved temporarily so as to bring in partial revenue to assist in carrying until speculative high returns may become a possibility through contemplated demand for intensive use. Farm lands are in less demand than bonds because of the greater personal effort required and than city business property because of the lesser possibilities for assured annual and speculative future return. Tree farms have to do with cropping about the lowest order of lands known, with a crop requiring not one but many years to mature, maturity coming at a time when value cannot be measured in dollars and when dollars cannot be evaluated with any degree of safety because of the laws of supply and demand and fluctuations in purchasing power. It is a fortunate thing that all capital cannot economically flow down one funnel and that it is always seeking new avenues of investment. It is also fortunate that, in the final analysis, basic commodities for human needs sooner or later form the soundest type of investment. We may do without luxuries and near luxuries, but mankind cannot long exist without food and shelter. The forest is our cheapest source of shelter.

With sustained yield an assured thing, the case would be simpler for private ownership. Some may hold that we have sustained yield in Oregon, because our gross cut is less than gross potential yield. At first glance it seems reasonable. That particular argument has

always seemed reasonable. The Atlantic Seaboard looked to the north central states--the north central states looked to the south and now the south looks to the west. We have had continuity of a sort because of visibility of supplies ahead made available through our excellent transportation systems. But now, New England, feeling the pinch, recognizes the fact that visible national supply does not meet her territorial needs. Michigan finds that distant fields do not bring timber farming and lumber industries to her. And even in Oregon, certain counties are not over-joyed at the prospect of losing timber revenue to other counties. In its true sense, sustained yield contemplates a fine balance between average annual cut and producing capacity for each forest zone. By zone, I mean any given area which may be handled economically as one operation. Thus we consider this question of continuous use not in terms of visible supply for the nation as a whole but rather in its integral parts. No machine ever synchronized properly with too many flat spots on the drive shaft.

Now if we had the meritorious instead of the merititious type of sustained yield there would be greater hope for private endeavor. Constant cutting paced by growing capacity brings in constant revenues to assist in carrying the load. But there are many things to interfere with sustained yield even in addition to the problems incident to marketing, remanufacture, manufacture and logging, set forth herein before. These are the problems of primary markets, mobility,

ownership allignments, physical condition of trees, growing capacity, purposes for which trees are grown, age considerations, hazards, taxation and finance, which loom up large.

It is very natural that forests are cut where they may be easiest got. So we have concentrated activity in most accessible spots. This in turn brings about a cutting program upon the area logged greater than regrowth possibilities. For instance, Columbia County has an estimated virgin stand of approximately 7 billion feet from which we are now cutting at the rate of 700 million feet per annum. If there were a young stand coming on as rapidly as we are cutting, then we would be operating that county on a sustained yield basis. But such is not the case. We are cutting far in advance of regrowth and in many spots, no reforestation or second growth has appeared.

Increasing mobility of timber makes it possible for a given saw mill to disregard surrounding deforested conditions, drawing supplies from distant zones and preventing them from orderly development. How broad these unbalanced zones may become is a question. We are hauling logs greater distances all the time. Even now we have a proposal in Oregon to haul logs from above Albany to Vernonia for manufacture. Railroad need for tonnage movement and milling in transit rates on logs have a distinct influence upon extending operating radius, tending to centralize milling operations at primary shipping points. But the moment each forest unit is put

upon a rotation basis we lessen the local problem and tend to diffuse milling operations. But the pendulum again swings back to manufacturing in large centers through consumption of waste unless that which now is waste may find a higher use so as to be shipped as such instead of in the log from local mill to point of conversion. Until cutting and mobility factors settle down, we are not going to find a broad definite program of forest management for continuous use.

I fully believe there will be room for milling operations reasonably close to the forest. These mills and forests may or may not be in one ownership, although I am inclined to think the tendency will be toward vertical combinations for self preservation on the part of the saw mill. Constant need of raw supply coupled with short-line haul economies should bring the mill closer to the forest. Increased mobility will be a deterrent. If the value per unit of log weight were as high as wheat, we might look for a situation analagous to the relationship between flour mill and independent grain farmer, mills distant and ownership separate. As log value increases, the longer the possible haul to mill. This affords broader opportunity for independent marketing. We have some interest displayed in artificially reforesting with high valued species. There is no indication that values of Douglas Fir, Yellow Pine and Hemlock will increase sufficiently to afford mobility over any broad area. This may bring us back to operating zones where we choose to be.

Out of the struggle between zone independency and mobility in-

roads, we may expect a clearer public understanding of the advantages of permanency. On the one hand, people within a zone will endeavor to preserve the milling operation at home. On the other hand, the outside mill will endeavor to win friendship through insuring reforestation. Both moves would be popular, both forces need popular support. The matter of ultimate financial return from new forests to present operation will be somewhat eased by present financial return from showing of a permanency program linked with industrialization of an operating zone.

Ownership alignments have been the source of great difficulty. Under federal distribution of land, aimed to spread wealth broadly among the people through gifts of small tracts, we have a hodge-podge of forest land ownership. It was first believed that land capable of bearing trees could be used for intensive farming. Out of this comes the attitude taken by the Interior Department that forest land is only forest land so long as it supports a substantial forest growth, after which it is "farm land." Through long experience, the Agricultural Department has demonstrated that soil, topography, population and market considerations determine land use. Outside of our national forests and parks, the Interior Department has and continues to control. What is the result--checker-board ownership of essential timber land and interference with establishing units of operation. Political and legal subdivisions prevail instead of natural division. Some might hold that this

has been conducive to ultimate good. It would be illuminating if one were to detail the course of private ownership. It is said that there are some 30,000 different ownerships of tree farms in Oregon alone, many of them consisting of forty, eighty, and one hundred and sixty acre tracts. This is a sturdy problem to cope with in blocking out units. Is blocking out a desirable course? Can a wheat farmer operate successfully and continuously with 160 acres of ten bushel land? Can a livestock raiser live upon 500 acres of low yield grazing land? The answers are obvious. We have 1,000 to 10,000 acre wheat farms and 10,000 to 100,000 acre stock ranches out of sheer economic necessity. A medium sized saw mill will cut 24 million feet annually. Take a growing capacity of 600 board feet per acre per year in the Douglas Fir belt and we have an area requirement of 40,000 acres, without allowance for failure to crop and the hazards of fire, disease and insect attack. Compactness of ownership is more important to forest management and operation than to wheat and stock enterprises. Forest trails, roads, and logging shows with all the incidentals mean maintenance and investment of a heavy nature. Interspersed ownership sets up extra costs and hazards almost foreign to other types of farming. But interspersed they are and blocking out will not be any too easy. With broader knowledge of forestry and with a definite receptiveness of the idea of continuous use, we find ourselves back on the road to permanency, struggling along.

The physical condition of our virgin forests is disturbing. We have vast areas of over-ripe, disease infested, insect attacked and fire damaged stands which should be opened up. Due to the failure of the rest of the United States to go upon a sustained yield basis, cutting into these areas now cannot be done with profit. When holding proves a greater loss through decadence than operating in the face of overproduction, the latter course will be attempted. If all of this nation were upon a sustained yield basis, Oregon could multiply her production and there would be a shortage instead of an overage. If operations within Oregon were limited to sustained yield, opening of forests would be broadly undertaken throughout Oregon. Decadent stuff would be removed fittingly faster than zonal reproducing capacity. While this disturbs continuous steady use, it is a proper course so as to insure reasonable future continuity. The longer we delay the greater the decadence, the sooner we open up, the greater the over-production under present conditions. Oregon is faced with a dilemma which could be met were we not dependent upon outside influences. So we should strike boldly with in and without for the sake of our independence.

The extent to which private forestry will now be practiced is influenced by growing capacity, age considerations and purposes for which trees are grown. If we find a very high annual yield we attract. As this producing capacity diminishes we detract. Thus, if we can grow 1200 board feet of fir per acre per year, there is

more inducement to private ownership than if 800 or 400. Cost of financing, protection, and operation is controlled in part by acreage, more so in the region west of the cascade summit because of roughness and undergrowth. Growing capacity should be known. Studies already conducted have done much to reveal soil possibilities. Closely allied to capacity are age considerations. The longer it takes to mature a tree the less manifestation of private interest. Present balanced rotation bringing in constant revenue offsets age problems. Future balanced rotation programs are only interesting as they afford a speculative return aided by increased marketability of lands bearing young forests. Revenue from grazing (largely confined to the East side) and revenue from thinnings (largely confined to the West side) will assist private ownership. Such revenue is dependent upon marketability of the product. Grazing values are fairly well established. An interesting development is found in the "Christmas Tree" trade, through which some baby stands have taken on value. At eight years, careful thinning will some day produce revenue exceeding cost and at the same time will benefit the dense stands by preventing "strangulation". Increased demand for posts and small poles assures revenue at the twenty year period exceeding cost of second thinning. Broader use of conifers in pulp and large pole needs brings in revenue of appreciable value at the third thinning say at thirty five years. Pyramiding of volume and unit value up to sixty years, through rapid growth,

natural pruning and clearer lumber will induce owners to hazard the next fifteen years. Thus the financial burden incurred in bringing a forest from zero to maturity regardless of age is lightened by intermittent revenue. Compound interest factor must be carefully balanced against growing capacity and age considerations. The greater the compound interest items, the shorter the period of growing. Fortunate for both west and east side, this may be somewhat overcome. In the west, if weighted charges press too heavily we may drop our marketing age through broad use in lumber and pulp, particularly the latter. On the east, we have annual revenue from grazing often yielding as much profit as trees themselves, so stock and trees work hand in hand. Private ownership thus is becoming more hopeful.

Hazards are numerous. Fire is the greatest curse. One would suppose that aridity in Eastern Oregon would be conducive to greater fire danger than in Western Oregon. The converse is true. Open forests on the east side with little underbrush, with grazed grasses, with a minimum of litter are excellent insurance. Closed forests of the west side, with heavy rank undergrowth and a maximum of litter are tinder boxes ready to burst into flame when dry seasons are too prolonged. Humidity in the west plays a tremendous role in high hazard conditions. Transition from virgin to man grown forests may be safely voyaged by careful ground work at logging. Education, regulation and patrol are aiding prevention. Our laws should

be broadened to permit closure of fire hazard areas to general use. At present we close all areas or none and this is confined to sportsmen alone, and aside from the forester, the forest has no greater friend than the sportsman. There is little justification in simultaneous closure of the all forests and in leaving them open to use by all but hunters. There is justification in closing areas of high risk to all use. Pre-suppression is being aimed at through fire weather-reports, patrol, towers and communication. Suppression is improving with trained fire fighters, right to draft civilians, roads, trails and fire fighting equipment. As we perfect method and application of measures for prevention and suppression we lessen insurance costs underwritten by the owner and encourage insurance companies to come into the field. Great strides are being taken by cooperative agencies, private, state and national to bring this about. All around consciousness of the problem is rapidly awakening, pushing the cart along our road to destination. We know very little as yet about control of disease and abating insect infestations. Recognizing its responsibility, an inclination to cooperate with all owners in the fight is being shown by the federal government. Some progress is noted, but only through research may we know the answer and research is costly. To contemplate loss in one summer of several million feet of timber through blister rust or pine beetles is not cheerful. Dead trees increase fire hazards, so unless we meet this situation we may find cur-

selves going around in circles instead of cycles.

One of the most perplexing problems in all of forestry is the equitable taxation of forest type lands so as to be fair to owner and public alike. In general, our annual tax system is applied to all properties regardless of land use or productive capacity. In timber, this system has compelled the same crop to pay taxes many times. While other cost factors rest largely with the owner, tax expenses rest with the public.

Theoretically speaking, taxes are payable when the party taxed is able best to pay. Annual payment is predicated upon annual or oftener than annual crops or rentals or interest or other income. This method has become so ingrained in our minds and interwoven with our political structure, it is difficult to realize that universal application does not always work out. Particularly true is this in forest taxation. Here we have a crop from which there is no revenue for several years, the growing stuff not ready to cut, the mature impractical to cut because of economic conditions. In applying annual taxes year after year to a growing crop we are upon dangerous ground. It is like applying and collecting a tax on land and oat crop at the end of each and every one of the ninety days required to mature said oat crop--only worse because oats maturing is measured in days and timber in years, so compound interest factors in the one are minimized and in the other magnified. When we recognize in deed as well as in theory that taxes are payable

when the party taxed is able best to pay, we will rectify what has been one of the principal causes of liquidation.

Uniformity and stability in taxation of forest lands are essential to continuous use. Because of the long growing period, a multitude of problems in finance are met. To determine with reasonable certainty what these costs are is necessary. Excessive and irregular taxation produces an uncertainty. Suppose now we take an annual tax of fifty cents per acre on virgin timber which will not be cut for thirty five years, the tax carrying cost is not $\$5 \times .50 = \17.50 per acre but is at 6% compound interest $\$55.70$ per acre. (In 60 years it would be $\$266.50$ per acre) Presuppose the stand at 30,000 feet of merchantable timber per acre worth $\$2.00$ per thousand at cutting and you have an acre value of $\$60.00$. After paying taxes all you have left is $\$4.30$, measured in terms of the present value of the dollar. Out of this residue, must be deducted original and added permanent capital investment, plus interest thereon; annual protection and insurance costs plus interest thereon; and depreciation and depletion charges. These are the items people forget. No farmer growing oats or wheat is subjected to any fluctuation in tax costs during the crop growing period. He knows that there will be no disturbance during the season. If tax rates jumped around every day, such farming would be precarious and permanency would be jeopardized. Stability is essential during the growing of any crop.

We may rightfully conclude from the standpoint of timber and the public's future that taxes can better be paid at harvest and theoretically should be paid then; that assessments should be based upon producing capacity rather than upon full value year after year; that the amount should be justly proportionate; that the annual charge if any should be fixed for the sake of stability.

Costs of government must be met to enjoy political and social stability. Any material change in revenue which is not a studied part of the whole is apt to be upsetting. Oregon's timber is a fruitful source of public revenue. In many counties it constitutes a very important part of the total. Likewise, in many counties, the bulk of usable land is largely fit for growing trees only. When virgin stands disappear without a definite continuity program, a gap in timber revenue appears. This brings about these very serious conditions; first, taxes are pyramided upon remaining stands within the county confiscating them or forcing their early liquidation; second, county financing and credit are jeopardized; third, the county cannot keep in pace with the development of the state as a whole or pay to the state its just share of the costs of state government; fourth, the burden is shifted to other parts of the state; fifth, reduction of forest tax revenue tends to raise taxes higher on other agricultural lands in the same county; sixth, the resultant insolvency of such counties, can only be overcome through rehabilitation of depleted forest lands, which brings in a still

greater tax burden upon the entire state; seventh, when the productive areas of any state are largely forest type the entire state's credit is at stake. It is a vicious circle not easy to avoid.

Another disturbing result of depletion as distinguished from sustained yield lives in the invitation to impose high taxes in response to a public desire to obtain as much revenue as possible from timber while it lasts. Spurred on by this desire, abetted by a passion for county supremacy in public improvements such as monumental buildings, master highways and power development, the public has been led to extravagance which has resulted in ruination of a permanency program. The industry is interested in liquidating, cleaning up and getting out. The public is interested in securing all the tax revenue it can get, even to mortgaging the future. The natural result is timber mining, denudation and gaps in public revenue. And the very thing upon which that county or city justifies its existence is wiped out.

Although we have nearly cut out some of our timber counties and although they are suffering, Oregon is young in its timber exploitation. Submergence of local pride in great public improvement coupled with a sane and sympathetic attitude on the public's part is necessary now. The opportunity to avoid mistakes in other states is afforded Oregon. Let us tighten our belt straps and settle down to work.

It is wholly reasonable to insist that we set up an ideal system of taxation of forest lands for Oregon and then through gradual change bring our present ad valorem system over to the new. Inequalities have come about slowly and slowly only may they be set aside without injury to the public. Processes should be evolutionary not revolutionary.

We may quite properly apply such a system of taxation almost in toto to our cut over areas. None of these lands will be retained if they are unprofitable. Nor is any lumberman going to undertake reforestation without some assurance of a reasonably constant cost. Nor is he going to employ logging methods for the benefit of the future crop. Tax revenues derived from such lands are inconsequential--for if too highly assessed they become delinquent and if low they form but a small part of the total. Here then we may start with least disturbance to public revenue. To assist in keeping these lands in definite ownership and at the same time to assist in yielding a reasonable tax return are public responsibilities.

Through remedial tax legislation, various states have aimed to assist in creating true values where such values did not exist, thus encouraging ownership, which in turn means protection, the first step in private reforestation. In taxing essential forest lands, one of the following methods may be employed:

1. Assess according to producing capacity of land;

2. Assess at "one" when bare, gradually increasing to harvest;
3. Collect a yield tax only at harvest;
4. Collect a nominal annual sum plus a yield tax at harvest.

Twenty seven states in the Union have enacted laws for the purpose of encouraging reforestation. In most cases, they have waited until virgin stands have been seriously depleted, with costly results.

Profiting by the lessons of others, California, Idaho and Oregon have passed laws with virgin stands still around them, so as to promote sustained yield at as early a period as practicable and so as to avoid the disorganization which follows where virgin stands are removed without thought of continued use. California theoretically taxes according to producing capacity of land. Idaho and Oregon collect a nominal annual sum plus a yield tax at harvest.

THE CALIFORNIA LAW ENACTED IN 1925.

In one sentence, California enacted a reforestation tax bill of great possibilities. "All immature forest trees upon lands not previously bearing merchantable timber, or-----upon lands from which the merchantable original growth timber to the extent of 70% of all trees over 16 inches in diameter has been removed, shall be exempt from taxation."

Under this provision, it is not required that 70% of all

mature growth over 16 inches be removed. The test is Merchant-
ability. Unmerchantable trees are exempted regardless of maturity
or size. Operators are encouraged not to remove low or non value
along with high value growth. 30% of the merchantable mature growth
may be left for selective logging and for natural reseeding. This
should also prove some inducement to those who would artificially
reforest by hand planting species of higher value than species
indigenous to the soil.

The law further provides, "That forest trees or timber shall
be considered mature for the purpose of this act at such time, after
forty years from the time of planting or removal of the original
timber as above provided, as a board consisting of a representative
from the state board of forestry, a representative from the state
board of equalisation and the county assessor of the county in which
the timber is located, shall by a majority thereof so determine". In
other words, when the new crop has been adjudged mature, it is again
subject to taxation on the theory that it is a crop in storage.

This should prove attractive to selective logging on a sustained
yield basis. Under normal conditions it would be advantageous to
keep within the exemption privileges. Under abnormal conditions it
might be advantageous to keep the mature crop in storage for the
same reason that any farmer might keep his grain in storage.

However, all forest areas are still subject to ad valorem rates
on bare land value. Under scientific appraisalment, these areas

would be evaluated according to producing capacity. While sound in theory, will it work in practice? What is producing capacity to be measured by? Have we sufficient dependable information?

Although this bill has been in effect for four years, a tone of discouragement is sounded by many who expected early results. They argue that the uncertainties of ad valorem taxation are still present, thus throwing an indeterminate figure into silvicultural costs during the transition period between virgin and man-made forests. There will be within a county and between counties, periodic fluctuations in tax costs due to variations in millage and in appraisal due to changing administrations which is a handicap when dealing with crops requiring not one but several years to mature.

They also state that certain large areas will have to be restocked heavily by hand planting and ask if it is economically feasible for private capital to carry the annual tax until harvest, even if there be no undue losses from failure to "catch" from fire or from attack by insects and disease?

There are likewise many others who admit the inertia that must be overcome in general, but point to the conscious effort toward permanency now being made. They feel this measure is eminently fitted for California because, (1) selective logging may be almost universally employed, thus providing uninterrupted income; (2) in many regions, unusually rapid growth takes place so that returns on investment come in early; (3) broad utilization is possible through

many large, proximate, primary markets; (4) there are many sources of taxable wealth so that timber need not carry so large proportion of cost of government as it does in other states; (5) because of grazing, watershed and recreational considerations, public sentiment would quickly frown upon discouragement to reforestation.

THE IDAHO LAW ENACTED IN 1929

In Idaho, any owner may submit a verified petition to the State Cooperative Board of Forestry, asking to come under the reforestation law, by showing description of lands, that they are chiefly valuable for growing forests, that he desires to hold the same for reforestation purposes, that all persons holding encumbrances against said lands have joined in the petition, that delinquent taxes, if any, will be fully paid within thirty days of granting of petition, that he will obey present and future rules and regulations and laws pertaining to these lands as to management and harvesting, that he will pay his proportion of protection costs, that at time of filing verified petition, said lands have on no legal subdivision timber of commercial value.

Then the said forestry board holds a hearing for the purpose of determining the merits of the petition. If it finds favorably, it makes and enters an order granting the request of the petitioner.

All such lands are then valued at a flat \$1.00 and are subjected to all millage taxes. All other values are still taxable in addition to forest values, including grazing. At harvest the forest crops are

subject to a yield tax of 12 1/2% of the value of forest materials cut, based on the full current stumpage rates at the time of cutting, to be determined by the State Board. The Owner or the county may appeal from the decision of the said board.

The passage of the act, the verified petition of the owner and the making and filing of the order by the State Cooperative Board of Forestry constitutes a contract between the State of Idaho and the Owner, running with the lands, for a period of fifty years whereby the state agrees that no change in the law shall apply to said lands except as the said board and owner agree in writing.

At the expiration of fifty years, said contract may be renewed by mutual consent of the then owner and the said board. If not so renewed, the merchantable timber on said lands is immediately subject to the full yield tax whether cut or not.

There are many other details, but this will suffice to give the essence of the bill.

The only way this law is effective is through a contract, which requires the voluntary act of the owner. Will it meet the emergency? Has inertia in Idaho been sufficiently overcome to expect early participation under the law? Are owners broadly enough committed to perpetual or long time operation to induce them to contract each piece as it is cut? The law is a step in the right direction and time will show its effectiveness.

THE OREGON LAW ENACTED IN 1929.

What may the people do to help keep all essential forest lands in Oregon at work producing crops? What steps are necessary to overcome the usual inertia displayed by owners? May a permanent system of taxation be devised providing reasonable ultimate revenue and at the same time suiting the needs of forest crop production? These were the questions Oregon sought to answer in enacting its reforestation law.

CLASS OF LAND AFFECTED.

The act calls for classification of any and all lands suitable primarily for forest production, but excludes such lands as now support mature forest growth in merchantable quantities. If any land contains mature or second growth and is valued and assessed for its forest growth on the 1928 tax rolls, then the law applies to such land only upon approval of the County Court of the County in which said land is located, or until this valued and assessed forest growth is cut. Lands may be classified as reforestation lands where, after harvesting mature timber, an immature stand is left for a future crop.

The act does not apply to lands suitable chiefly to higher use. If lands now considered as reforestation lands, should be improperly used or should have now or develop later values other than for forest growing, such other values may cause declassification or may be the basis for additional ad valorem taxation.

LISTING FOR TAX PURPOSES.

All lands complying with classification specifications are listed for tax and regulation purposes through public agencies without application by the owner. As a matter of fact it makes little difference whether the owner wants it or not. All lands of similar character and use are placed in the same tax status, which is sound economically.

It is the duty of the State Board of Forestry to determine what lands may be classified as reforestation lands, to prepare a list for each county and to send this list to the assessor. On due notice, the board holds a hearing in the court house of the county in which the lands are situated, for the purpose of receiving all arguments for or against the proposed classification. All interested parties may take part in the discussions. Thereafter, the board reconsiders the proposed classifications and prepares a list of lands which it recommends for classification and forwards this list, together with the report of the hearings, to the State Tax Commission. Thereupon the State Tax Commission considers the hearings or any matter bearing thereon, reviews the lists and prepares an order finally determining the classification. |

Preliminary classification started on its way immediately after the act took effect. It is required that each year the board determine what lands, not already classified, should be proposed for classification, thus providing aggressive continuity of program. 5.

Appeals from the decision of the State Tax Commission may be

taken to a court of competent jurisdiction by interested parties. The public, the owner and other party affected may have their day in court.

ADMINISTRATION REQUIREMENTS.

All reforestation lands are subject to police powers of the state, present and future. The present compulsory patrol law requires that each land owner must furnish protection from fire to forest lands and the fighting of fires thereon regardless of where the fire originated. It is the province of the State Board of Forestry to see that this protection is effective. The same is true in combatting insect or disease infestations. Broadened police powers of the future automatically apply to the reforestation law. As the rights of society are pronounced, we may find in that pronouncement certain requirements as to logging methods, and artificial restocking seed trees. Periodical inspection by the board is ordered. Experience teaches that, if thorough protection from fire is given, these lands, natural reforestation will have a good chance. q.

METHOD OF TAXATION ADOPTED.

All classified and listed lands are subject to, and only to, an annual fee of five cents per acre per year, plus a yield tax of 12 1/2% of the gross value of all crops when and as harvested. This does not materially disturb public revenue and should

constantly increase public credit. Owners are given a fixed nominal annual fee so that carrying costs may be estimated for the growing period. Compound interest factors may be minimized when the owner selectively cuts; revenues from thinnings are recognized more and more as of importance. Other revenues may be developed. The yield tax comes at harvest when the owner is best able to pay. Forest crops under the Oregon law mean timber, forage, chittim bark, christmas trees, fruits, ornamental shrubs or any other marketable growth from the soil. It is all subject to the yield tax.

While it is appreciated that the only place the owner can be repaid for the five cent annual forest fee is out of the crop when harvested, yet this fee is not regarded as a tax because it is not based upon value. The only tax is the yield tax which is a definite percentage of what the land produces or a definite percentage of the value of the crop. The yield tax is based upon value. 5.

COLLECTION OF FEES AND TAXES

On the March first, next following final classification, all such listed lands are placed upon a separate fee roll, and on March first of each year the five cents per acre becomes a lien, collectable in the same manner followed under the ad valorem system.

Any ad valorem taxes that had become a lien prior to classification remain a lien. Payment of delinquent taxes is not a condition precedent to classification.

When ready to harvest, a written permit must be secured by the owner from the State Board of Forestry, setting forth unit value of respective kinds of forest crops to be harvested. The unit value is set by the board and is open to public inspection. If owner is dissatisfied with the value, ways and means are provided to arrive at a settlement. In harvesting, the owner is required to keep an exact record of the number and kind of units severed from each legal subdivision of not more than 160 acres, and to report the same to the State Board of Forestry and to the County Tax Collector within fifteen days after the last day of June and December of each year. The report to the tax collector must be accompanied by the owner's remittance of the yield tax due. Failure to obtain proper permit or to remit taxes as provided, subjects owner to penalty. When there is doubt of owner's financial responsibility, the board, before issuing permit to harvest, shall require a bond adequate to indemnify the state against loss of yield tax revenue.

In inserting an optional contract feature, the authors of this bill intended to give those contemplating the investment of capital in timber growing and desiring some additional assurance that their liabilities for taxes would remain constant during the long period required to grow a timber crop, the right to enter into a contract with the State, by which the State guarantees on its part that the fee and tax liability on the said owners classified and listed re-forestation land will remain constant for a period long enough to

mature a forest crop and by which the owner guarantees on his part that he will take such additional steps as the State Board of Forestry may specify to make sure that the lands are kept in productive capacity. Contractual time limit is governed by the needs of each case--such as purpose, species and location. The optional contract feature is in recognition of a principle desirable in legislation affecting crops that take a half century or more to grow. No contracts may be entered into until July 1st, 1933.

SUMMARY.

Oregon has endeavored to measure up to its public duty by removing economic obstacles. This state has gone a step further by attempting to overcome inertia through automatic classification. If an operator wants a contract in addition to this, he may have it. Oregon has tried to help make private reforestation pay. Surely the inducements offered are sufficient to encourage owners to retain title to logged or burned forest lands for reforestation purposes, to protect them and to apply practical measures of scientific management as a matter of self-interest.

Although in force only since June of 1929, there have been classified and brought definitely under the bill, more forest land than in any two other states in the union enjoying reforestation legislation for a period of many years. Paradoxical as it may seem, actual county revenue has increased though assessment rolls decreased. With tax obstacles on cut-over lands substantially reduced, we find

operators hanging on, because of fire insurance to remaining stands; they do not want to face adverse criticism on account of delinquency as long as they have merchantable timber in the county; pride of ownership; possible recreational, mineral and crop values; speculative future value of a growing crop even before cord wood size through influence of cellulose revelations; popularization of industry by advertising definite reforestation program thus breaking up substitute inroads. By and large, this is keeping the cut over land problem in control until we are able to demonstrate that permanency pays the private investor.

It is gratifying to note, that second growth and cut-over lands in Clatsop County are being bought up from the county delinquency list and from private individuals. Previous to enactment of our law, delinquency and reversions were alarming. Now that value has been given to cut-over lands, they are becoming marketable. Conscious effort to block out units for future operations is in evidence. Furthermore, owners of virgin stands are giving close attention to the advantages afforded present operations through justifiable treatment of their cut over areas as real assets. As previously shown, permanency automatically changes depletion and depreciation charges in land, timber, logging, manufacture and remanufacture. The converse is true, depletion and depreciation charges automatically change permanency's possibilities.

Gradually to swing virgin stands over to this system of taxation

is a problem we face. A sudden change would be injurious to both public and industry. It would increase tax revenue in counties where timber operations are well under way, but it would materially drop them in sub-marginal areas. Public revenue is dependent upon and has been built upon visible sources. The new system is predicated upon starting from zero and working through to maturity. The old system has required advances of tax income to the public whether the public has earned it or not. If we apply the new we overlook advances made under the old. Herman Chapman in Forest Finance holds that "the public have no inherent economic right to such advances, except the right of necessity, which justifies whatever advances the owners can stand without driving them out of the enterprise; but if the owners refuse to undertake this enterprise in the first place, the public is put in a most precarious position, and lack of recognition of this situation is an instance of economic blindness fully as culpable as any attaching to the owners themselves in originally wrecking a going concern without considering either their own or the public's permanent benefit." You will ask why with a reforestation bill in effect are we concerned more with taxation? Just this, that our goal is continuous use and permanency, and if removal of virgin stands is forced through economic obstacles, we assuredly will suffer zonal cessation of operations for a broad span of years. This means less care in the preliminary steps to reforestation, liquidation of going concerns, removal of large capital sums from

timber to other fields, a break up of sustained yield and loss of public revenue.

We may approach the new system through transition. Thus, first year accept our old ad valorem tax; second year drop a small amount of the ad valorem and accumulate upon the county records a fraction of the yield tax, that fraction to be immediately applied to all timber cut during the second year; each successive year following the same practice until the transition is completed. Then we will have all timber land upon the same basis--5 cents per acre per year as a fee and 12 1/2% as a yield tax. The burden will fall heavier upon counties and industries in them where timber development is well along. For that reason it would be wise to carry the transition period for a term of years to assure as nearly as possible an average equitable solution. By that time, it is devoutly to be wished that we will have stemmed the tide of liquidation, established a definite state-wide program of permanency and started actually to enjoy the benefits thereof. At the very least, there is nothing to be lost in the attempt and the public will have gone a long ways toward removing one of the serious obstacles.

As capital investment in mill and timber increase, individual capacity to finance becomes restricted. There are few large closed corporations left in the industry. Capital is being sought through broader ownership and participation in the form of stocks and bonds. Finance houses are leaning heavily toward marketing securities on long time

operations, more and more shunning short lived mills and timber stands. They realize that heavy investment in plant and equipment melts into a mere nothing with disappearance of raw supply. Pressure from this direction is having a beneficial influence upon permanency. Recently, a large Oregon corporation was refinanced only after a showing of a reforestation program upon 75,000 acres. It is conceivable, that the time will soon arrive when timber stocks and bonds will be as commonly listed upon the exchanges as steel and copper. How much more it would profit a man to sell his stock in a going concern than in a liquidating one! Then the problem of long maturity fades in the light of ready marketability.

It is the dream of foresters that at least one-third of our forest type soils will remain permanently in private ownership. Oregon has it in its power so to do. Only to grasp its full significance and earnestly, scientifically measure up through broad vision and steady purpose counts and times our existence in with the echoes of progress.

What of the other two thirds? The National forest service is desirous of taking over the responsibility of no more than $\frac{1}{3}$ of the total and in Oregon they have just about reached their goal. That leaves the remaining $\frac{1}{3}$ to the state and its political subdivisions, to national parks and Indian lands.

In the case of state, county or municipal forests, extension of areas should be accomplished by purchase, exchange or legislation for

prompt incorporation therein of forest lands reverted for tax delinquencies. It is of the utmost importance that reverted tax lands valuable primarily for timber production shall be placed promptly under some definite form of public protection and control to the end that their timber-growing possibilities may be fully conserved, that existing regional protection organizations may be maintained unimpaired. There are many tax reversions and there will be more even though we do have a reforestation law. These are some of the causes: definite liquidation of certain operations; failure to measure up to a sustained yield program; spotted and uneconomic unit ownerships; producing capacity below private capacity to profitably finance; and improper financing. It has been shown that with proper fire prevention and suppression, forest soils are preserved, seeds allowed to germinate and second growth conserved. It has been demonstrated through practice revealed by federal research, that even in the Douglas Fir region as much as 65% natural reproduction will set in if successive burnings are avoided, in spite of present wasteful logging methods. It is known that without definite ownership, protection is not adequate. Therefore, it might be well, after classification of forest type soils, to change the three year redemption period to one year or even six months. A six months redemption period is not without precedent in Oregon, for it is found in diking, drainage and irrigating district laws. Municipalities and counties should be given the right to acquire such lands. If

they exercise the option some provision for financing themselves must be made. With better knowledge of forest soil and second growth values, a measurable public equity may be set up, upon which necessary credit may be obtained. Checks and balances are imperative to overcome present tendencies to unjustly mortgage the future. The state too, should have the right to step in. All public agencies will require power to purchase or exchange so as to round out zones or operating units for the sake of economy. When the state becomes owner, at time of harvest it should be reimbursed for capital investment in crop as distinguished from land, expenditures for maintenance and management and reasonable interest on the entirety. The residue if any should be paid over to the county in which such forest or forests lie. If during the interim between acquisition and harvest, such counties are in need of money for costs of government, then the state may properly advance reasonable sums, the amount advanced plus reasonable interest to be deducted at harvest from the residual county equity; and if that then fails to equal the advances made, the remaining debt to be transposed into a bonded indebtedness from county to state, amortizable over a period of years measured by said counties anticipated capacity to pay. The second stage of indebtedness should not be so difficult to meet as the first, because it is fair to presume that by then we will have gone upon a sustained yield basis while now, by and large, we start from zero with state and local lands.

As to national forests, Oregon is fairly well advanced. While acreages loom large, actual merchantable stands are limited. This is largely due to extensive alpine and barren regions within national forests, unproductive, scantily clad, carrying inferior tree species or inaccessible. It is the policy of the forest service to solidify and round out holdings as rapidly as possible. The ultimate goal is almost reached. The present difficulty lies with interspersed and intermingled holdings and with irregular, saw tooth boundary lines which interfere with desirable maintenance, supervision and operation in timber and grazing. There is need for a change in mining claim laws so as to protect forests from fake claims, made for purposes of setting up recreational centers within forests and of interfering with present and future operations; and at the same time so as to play fair with justifiable sub-soil enterprises.

Indian reservation forest lands should be kept intact and managed on a sustained yield basis, under correct forestry principles, for the permanent benefit of their owners. These large timber bodies play an important part in the economic welfare of adjacent communities. Spurred on by untold riches accruing to Indian brethren in the south through exploitation of oil deposits and egged on by that human urge to enjoy a maximum of the luxuries of life, there has been considerable pressure to force sale and cut of Indian timber out of line with reforestation, sustained yield and market

PAGE 101 INTENTIONALLY LEFT BLANK

conditions. This has injured both private and public permanency programs. The entire line up must be co-ordinated and the federal government should set the example. Furthermore, the Indian is in need of protection for with him it is a case of easy come, easy go, today is today and tomorrow will care for itself.

Publicly owned timber, federal, state or local, should be permanently managed, as far as practicable, on a sustained yield basis, and its utilization should be closely related to the economic welfare of the adjacent communities largely or wholly dependent on forest industries. Furthermore, such public timber within any economic operating zone, as far as practicable and whenever in the public's interest, should be utilized only to maintain existing forest industries or local requirements unless or until it shall be clearly evident that an over-production of the products to be cut will not result from their utilization under other circumstances. The policy of the public, federal state or local, in the utilization of public timber, should, whenever practicable, promote and provide for such utilization in connection with, and as supplementary to, the operation of adjacent or intermingled private forest lands on a sustained yield rate of cutting; and adequate protection in securing such public timber should be provided for operators whose plans for a sustained rate of cutting meet the requirements of the governmental agencies.

All lands in federal ownership or control which are more valuable

for the production of timber than for other use or for the protection of water sheds should be reserved and placed under a permanent form of protection and administration, preferably as national Forests; and a similar policy should be followed by states with respect to all forest lands in state ownership or control.

Public ownership of forest lands should be subject to an equitable financial arrangement in lieu of local taxation. The federal government has displayed a marked interest in county welfare through a return of 35 per cent of all gross income to the county in which that income arises. What proportion of that 35 per cent is spent in permanent improvements within the forest has not been shown. Too often, these moneys and other appropriations are considered as gifts from nation to state or county. Forest appropriations in the main are not gifts but are working and permanent capital required to operate a forest. Forest investments should be set up, evaluated and accounted for under proper methods of accountancy just as though they were privately owned. The federal government is in business, owning 13 million acres of Oregon forest land, with extensive management plans, permanent works, purchases and sales under way. Every citizen in America is a stock holder in the forest service corporation, and is entitled to know just what the balance sheet shows in resources and liabilities. When the federal government enters business, it should adopt business methods. More intelligent federal expenditure might be expected, because needs could be so much more easily understood. Certainly a more sympathetic attitude would be

forthcoming from eastern men who, in reviewing our pleas for help, have before them an intelligent financial statement.

The federal Forest Protection Board has submitted year after year to the Director of the Budget its estimate of funds needed adequately to protect the forests on federal lands and to meet the federal government's share in the protection of state and private forest lands as provided for under the Clarke-McNary act. The Forest Protection Board is required by the Budget Bureau to keep these estimates confidential. We believe that both the public at large and the state and private agencies co-operating with the federal government in forest protection are entitled to know precisely what the Forest Protection Board is recommending. The nation is in partnership with Oregon and "star chamber" sessions held by one partner are not fair to the other. Again I emphasize the statement that when Uncle Sam goes into business and into partnership it were well to adopt business methods. Our state's difficulty lies in the fact that we can regulate private, local and state enterprises within our boundaries, but not national though the existence of that national enterprise may involve a large portion of our domain. All we can do is plead that the nation measure up to its responsibilities adequately in adopting proper accounting methods, providing funds for protection, research, reforestation, roads and the other essentials so necessary to the continuous use of our forests.

Where the crop is grown, there lies a problem, deep, difficult and intriguing--a bottomless well of potential golden fluid, a tortuous course to our coveted goal and an everlasting gamble with

mother nature. Tree farming? It is a business requiring the attention of master minds.

CHAPTER IX

Conclusion

Whether we log or whether we lumber, we hear relief's call and see its distress. None of us can say where to place the hand upon the one sore spot--all we know is that patience, perseverance, sympathy and understanding unfold hidden secrets of the ages. Plodding along, ever and anon, bright-eyed and stiff-lipped, that counts! See the ultimate and strive for it. We have made a magnificent start. Let us all build values--by creating and increasing that the world may be better for our having lived.