SENIOR THESIS

on

ZONING AS A POSSIBLE SOLUTION
OF
THE LAND USE PROBLEM
IN THE NEW PUBLIC DOMAIN

Spring Term

by

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I had fully intended to take this problem up only from the angle of Forestry, but found it so bound up and so closely interrelated with the Agricultural phase of land use that my discussion hits on both phases.

Of necessity, in a problem so broad, as this one is, many generalizations must be made. Many little local problems or differences must be overlooked. The writer has endeavored to deal fairly with all the factors of the problem, but in realizing his own small encompassment of knowledge, he also realizes that there is no ONE solution. What he is offering is a second step in the solution of a growing baffling problem. The first step is already under way, or is in process of preparation, as surveys of various characters and various means are being made.

In fairness to those with whom I have discussed the problem and its phases, and to those from whom I have freely quoted whole paragraphs at times, I must say that this paper is not wholly original. The idea was original, at first, as far as I can determine, and its many ramifications have been fortified and broadened by suggestions, criticisms, and readings.

I am most deeply indebted to Sinclair A. Wilson, Limnton, Oregon, for his wonderfully helpful criticisms and suggestions, most - if not all - of which are included herein; to Dean G. W. Peavy for material on National Land Policies; to Prof. Starker for bibliographical suggestions; and to Richard Kearns, Assistant professor in forestry, for the impetus which led to my contacts with Mr. Wilson, and for the interest and time spent in discussion.

The many bulletins and circulars which are cited throughout, are listed in a Table of Literature Cited in the back.
INTRODUCTION

This is a paper on a phase of land policy. I think that it can be pretty generally admitted that we have about as poor an excuse for and as near to NO working land policy, as such - in this country as any civilized, advanced country could possibly have, and maintain its political, social, and economic stability. An analysis of Dr. Ely's often quoted bit of vision, "Under all the land," would show it to have more factual wisdom in its short length than is at first, or even at second thought, apparent. We cannot escape "the land" even if we would; for even in that last, final gesture, Death, the land opens and enfolds our weary bodies.

We are indebted to land as a municipality, for it serves as a base for all structures. We walk upon, ride upon, or in some way come in actual contact with LAND every day of our lives. Agriculturally, our indebtedness is based on the origin of all plant life directly from the soil and all animal life indirectly from the soil. Our great industrial plants are built directly upon the land, and obtain their raw materials from the land. They receive raw materials and distribute their products on transportation systems embracing wide use of land.

Often, we are asked to justify Forestry as a major phase of land utilization. The term Forestry in its broadest implication covers such a multitude of minor uses that to justify Forestry would be like trying to justify sunshine or rainfall. However, a few things stand out. Forestry

1. Benefits the soil by:
   a. Preventing or tending to prevent erosion;
   b. Acting as a deterrent to rapid water run-off, maintaining normal water flow and reducing danger from floods;
c. helps to "age" the soil by assisting in the weathering processes; and

d. provides a utilization for soil unfit for agriculture.

2. Effects humidity - for any considerable area the mean all time humidity will tend to be higher than in non-forested regions. The tree uses and gives off into the air from 100 to 1000 times as much water by weight as plant material it produces. This does not mean that there will not be periods of extreme moisture in treeless areas, or periods of drought in forested regions.

3. The credit of a nation is largely determined by:

a. The amount of natural resources; and

b. The employment of the resources indicates a resourceful, careful, thoughtful people.

Forestry is a natural resource.

4. Provide a means for balancing the budget of a nation by providing Federal incomes. The receipts from grazing alone on the national forests in 1930 amounted to $1,960,642, and the national income from hunter's licenses is estimated at $10,013,925 for the year 1929-30.

5. Forestry contributes public revenue to advance the people through schools, roads, and other improvements, and recreation.

6. Provides human occupation or a mode of life from the vocational standpoint.

7. lends to distribute wealth among the people. This broad economic principle is obvious as we realize the more than four thousand uses for wood and the many phases of forestry.

8. Offers a means of employment and taking up the slack in employment during difficult times. We need only to remember the successful California Labor Camps, the southern and central forests which provide work for the farmers; and the things which have been accomplished under the present economic stress.

9. Finally, the investment of money is possible in forests at a safe, low, rate of interest.

The total land area of the United States, exclusive of Alaska, is 1,923,000 acres. Of this, 973,000,000 is capable of use for crops.
The following diagram shows the proportion of land which is, or can be, used for crops under different conditions.

1. Forest and cut-over land not requiring drainage, 195,000,000 acres.
2. Subhumid and semi-arid lands; mostly pasture at present, 146,000,000 acres.
3. Land requiring drainage - 75,000,000 acres.
4. Potential irrigation - 30,000,000 acres.
5. Plowable pasture in farms - 112,000,000 acres.
6. Idle and fallow plowland and crop failure - 55,000,000 acres. (Probably much larger now-more nearly approaching 100,000,000 acres.)
7. Land in harvested crops - 360,000,000 acres.

The residue 950,000,000 acres to be used under various phases of forestry. There is 614,000,000 acres fit for forests of which 495,000,000 acres are commercial (396,000,000 is private and 100,000,000 public) and 119,000,000 acres are non-commercial.

We find that a great many uses can and must necessarily overlap; so we have the following other uses - grazing, 400,000,000 acres; wildlife, 150,000,000 acres; watershed protection, 385,000,000 acres (120,000,000 are now in active forms of management and administration); recreation 50,000,000 acres (I believe this to be too low an estimate); and wood production, finally - 300,000 acres.

These figures are subject to change, but serve to show the possible relationship of different land uses. It is doubtful that we will need much more than the 360,000,000 acres already in harvested crops, for we are finding the line of marginal farm land being continually pushed back by better methods of cultivating the soils. But the economic line of utilization is being constantly pushed in closer and closer as acreage production increases, and only the better soils are utilized.

The interrelation of socio-economic units' demands, if their utilization and advance in the future is intended, that we attend more closely.
to their workings and less to our own money or joy making. This is just as much an economic law as the law of marginal utility, and the pohh-poohing that it has received does not, in the least, change the workings.
THE NATURE OF THE PROBLEM WITH WHICH WE ARE FACED

The most conspicuous symptom to foresters of a general economic illness is the stoppage which we find in the lumber industry. Timber is practically a glut on the market. Markets have fallen off for one reason or another, while the cutting of timber has not fallen off proportionately. At least, not until recently when mills and camps were forced to close because of the lack of markets.

The closing down of mills and logging camps has thrown literally tens of thousands of men out of work; men who depended upon the lumber industry for their existence. And what has happened? We know only too well the familiar sight of evident unfamilied thousands flocking to the city streets in search of work; of hundreds of families trying to wrest a living from unproductive soil in deserted logging camps; and of individual border-land families living in unbelievable privation in a time of supposed plenty.

I shall not attempt to show why timber is a glut on the market, or why timber markets have fallen off other than to offer what seems to me three outstanding reasons. The rest is the problem for economists.

1. Markets have fallen off and have been falling off for several years because the peak in industrial, agricultural, and municipal expansion has passed. Lack of development of markets in competition with substitutes.

2. Timber has become a glut on the market because:
   a. Lumber producers have failed to provide for a normal market; believing that the curve of expansion which utilized their product would continue upward.
   b. Many owners have cut unwillingly and rapidly to liquidate their capital for meeting mounting taxes.

3. There is a tremendous process of land delinquency and reversion going on - creating, along with the "New Public Domain", so-called, many new and alarming problems which must be disposed of by solving them and not by ignoring them. This has
too often been the practice in the past. Reversion of lands to the states and counties is not confined alone to timber lands, but also includes millions of acres of so-called farm land, and much that is capable of producing crops. Neither are timber-land reversions confined alone to cut-over or immature lands. Thousands of acres of good virgin timber are going out of the hands of the owners because they can no longer afford to carry the load.

And so it goes - on and on - all over the whole country, creating a problem as dangerous, as important, and as difficult to master as if we were being invaded by an ever increasing enemy.

For example, there are in the three Lake States over 25 million acres of tax delinquent land in various stages of abandonment. In New York and Pennsylvania, land abandonment proceeds at the rate of some 250,000 acres a year in each state. In the entire country, there are probably some 100,000,000 acres of such land - approaching almost the acreage of the "Old Public Domain."¹

A report of selected counties in Oregon and Washington in 1928 reveals the following:²

In both Oregon and Washington, there is a class of acreage real estate called "timber." All acreage real estate other than "tillable" and "timber" is lumped together and termed "non-tillable" in Oregon and "unimproved" in Washington. In eastern Oregon, the non-tillable land is largely arid, while in western Oregon and Washington, the non-tillable and unimproved land is largely cut-over forest.

Of 7 Oregon and 3 Washington counties selected, there are 4 having a total tax delinquency (including foreclosed land) greater than 15%; namely Clatsop, Coos, Tillamook, and Clallam. All of these counties are west of the Cascade Range, and in all of them a great deal of cutting has taken place. The cut-over class has larger ratios of delinquent to total taxable areas than do other land classes in both Clatsop and Tillamook counties. Coos county is unusual in having more delinquency in the tillable class than others. (Probably due to the close tie between farmers and a diminished lumber industry, or because the farmers are occupying land better suited to timber growing.)

A classification of land according to use was made, and it was
found that "omitting residential and resort properties for which the figures are not particularly significant because of the small areas in this group," cut-over or burned forest properties have the highest delinquency ratios in six out of the 10 counties studied. "The merchantable timber class has the highest ratio in Baker county, the grazing class in Grant, and the farm class in Grays Harbor.

It was found that "for a given class of land, all of approximately the same unit value, delinquency will naturally increase as the tax per acre increases." This agrees with the conclusions reached by studies in all the other regions. While tax delinquency is not now (1930) as serious in the Pacific Northwest as in the Lake States or North East, delinquency has increased tremendously in recent years along with rising taxes and the removal of the virgin timber.

Substantially the same problem, tho to a greater degree, is faced in the Lake States. "In the forest counties of the lower peninsula of Michigan, 37% of the acreage area was delinquent in 1900 and 41% in 1928 (3,931,200 acres or nearly 4,000,000). Because of its greater ability to pay taxes, lands classified under the urban group had only 14% of its area delinquent." The total area delinquent in the Lake States group is over 25 million acres.

This process is not unaccompanied by grave results. We find, first, that state and county incomes dependent upon the taxes from these lands are greatly reduced, and the state or county is faced with the two-fold problem of (1) carrying on the functions of a state with a reduced exchequer and (2) having an increasing load of various grades of land all the way from desolate, over-burned areas, gutted and gullied farms in the southern regions, to virgin timberland in the Northwest and fairly pro-
ductive farms in all regions.

Reduction of taxable lands raises the tax rate on the remaining timber land and hastens the same end for it after possible liquidation to realize part of the investment, or even without cutting.

Other sociological effects are equally grave, for, as either timberland or farmland is turned over, there is a direct loss of employment, healthful community interest, and the like, far reaching in its effect as the blow is carried on out even to the milling centers. As a result, a disheartened populace begins to migrate, and in a short time we have the too familiar deserted towns, misfitted humans in other localities, loggers trying to turn farmer on land unfit for anything but timber - in short, once thriving small communities reduced to nothing, or worse than nothing - sore spots.

We find, for instance, that in Virginia where the problem has become acute, that the general property tax has been chiefly relied upon for raising of county and district revenue. Altho the maximum rates permitted by law have been levied for most purposes, deficits are common; particularly in several county and various school levies. The deficits are becoming more frequent on account of the declining value of agricultural, coal, and timber lands. To avoid them, expenses must be reduced; or assessments must be raised; or legal rates of levy must be increased. Perhaps all must be employed. An analysis showed that the cost per farm of maintaining roads and schools for the widely scattered communities is very high. In 9 of the 11 districts, the tax on farms was scarcely enough to cover the cost of building and maintaining the roads; therefore, tax payers other than farmers paid the entire cost of running the schools. These scattered, isolated, communities are usually in the midst...
of large timbered lands. As the timber resources become depleted, the farms will have to absorb this cost. It is obvious that they cannot do so permanently, and unless large appropriations of state aid (or other proposals) are made, the schools and roads must deteriorate. This in turn will hasten farm abandonment.

It is significant that 78% of the 45 rural school communities were located on soils designated as being non-agricultural, and the remainder were located on agricultural soils of steep or narrow topog. This fact, considered with the high cost of schools per occupied farm, confirms the validity of excluding certain soil types and certain kinds of topography from the zone of agriculture.

A study conducted in Laurel County, Kentucky, reveals the same problem. Land characteristics are the principal factor limiting the crop acreage. When the available crop acreage is thus limited, work off the farm is essential to obtain an income adequate for the elementary needs of living. The combination of soil deficiency and unfavorable topography undoubtedly would eliminate a considerable number of the farms in both areas as submarginal even under favorable conditions of farm organization. Steep slopes, erosion, rough topography, poor soils, stones, and weeds and sprouts in varying degrees and combinations, limit the amount of available crop land. Thus of 203 farms studied 20% had only 15 crop acres or less and 62% had 30 crop acres or less. These small crop acreages usually are associated with crop land having characteristics that do not permit an expansion of the crop acreage.

But the difficulty goes further. The actual crop acreage embraces land often wholly unfit for cultivation. The rapid deterioration of fields of this kind under cultivation makes impracticable the rotation
of crops. The result is rotation of the fields. The pernicious effects are obvious. The remedy is not to be found in the rotation of crops on the hillside land, because erosion can be controlled only by keeping these fields in grass. Moreover, where there is little or no land of moderate slope available, keeping the hillsides in grass and cultivating only the land of moderate slope is impracticable. For instance, farmer #175 owned 90 acres. He operated 80 acres, of which 38.75 were classed as crop land, described as follows: 86.5% heavily eroded, steep, hillside land with shale or stones scattered over the surface of the fields and with many weeds and sprouts; 5.2% of smooth to rolling land, heavily eroded and covered with surface shale; 7.7% of steep, hillside land in good physical condition; and .6% rich outcrop. In 1927, this farmer rented out 10 acres and cropped 16.5 acres. His net income derived directly from the farm was $84. He made his living by work away from the farm (probably in the forest areas.)

Another example - farmer #185 owned 145 acres of which he rented out 11 and operated 134. Sixty acres were classed as crop land, described as follows: 90% (54 acres) heavily eroded, steep land like that in farm 175; and 10% (6 acres) of smooth land in good condition. In 1927, this farmer had 26.5 acres in crops. His net income derived directly from the farm was minus $311. The $300 he earned by work off the farm (probably in timber) left him a net income of minus $11.

Such farms as these described above certainly have no place in the "best organization of and use of land." And it necessarily becomes part of our problem to learn a method of dealing with them. They can neither support a local government nor provide a decent mode of existence for themselves or their posterity, to both of which they owe something. In
such regions, timber owners must carry the taxes for benefits enjoyed and noted on by these farmers. If the farms were not there, economic organization and improvements could be affected.

Michigan, once the timber pride of the United States, finds itself in a condition not unlike that with which other states are confronted. Of the land area of southern Michigan only 7.6% is denuded or poorly stocked forest land. In northern lower Michigan, on the other hand, 51.2% is idle land or almost idle. In the Upper Peninsula, 30.9% is in a similar condition.

A distinct division can be made which divides the state into certain definite areas which have been noticed as being preeminently agricultural land and the rest predominately forest land, either logged, in plow, or timbered. The southern portion was found to have a large area suited to farm land, and the farms largely remained, even after the timber industry withdrew. In the other divisions, however, the story is different. We find fewer farms, more delinquency, fewer roads, and higher tax rates per thousand dollar valuation on farms. For instance, cut over counties were assessed in 1919 at an average weighted rate of $40.03 per $1000 valuation for local government costs; while that for agricultural counties in the same year amounted to only $28.02 for the same valuation.

The surface of practically the entire state is the product of glaciation, so that much of the land is recognized as having little agricultural value. This is especially true in the north where the ice sheet persisted for thousands of years after it retreated from southern Michigan. Three fourths of the whole area of some northern counties is either sand plain or swampy.

Settlement also differed in the north. In the south of Michigan,
the better land was generally cleared first, and as cities and industries grew up, the increasing demands for agricultural products made it possible to utilize even relatively inferior soils. In the north, however, farming waited on lumbering to clear the land - with few exceptions. The pine, which was cut first, occupied the poorer soils, so these were the first to be taken up. The converse is true as regards the hardwoods.

Primarily a forest state, then, farmers followed the lumbering industry in settling on cut-over land, and doing some clearing themselves. The history of lumber production and the "boom" which accompanied it is the natural prelude to tragedy. In less than 100 years, 33,000,000 acres or 92% of the original forest, had been cut or destroyed, and the land left in a terrible condition. Moreover, the counties and even the state, in addition to private land companies, encouraged settlement on this land, believing that the natural and only use for any land was farming. As the land was denuded, the farmers who had been dependent upon the thriving logging centers to market their crops were forced to abandon their farms, and the forest counties decreased in population. Withdrawal of timber interests raised taxes - hastening farm land abandonment. In one county alone 294 farms (more than 15,000 acres) were abandoned between April, 1916, and August, 1919. In another county, where there were 36 farms, none remain and the fields are all more or less grown up to Jack pine. One county reported 322 deserted farms in 1921. From 1910 to 1920, more than 2500 farms in northern lower Michigan were abandoned or consolidated with others, and their owners nearly all left the region.

Wisconsin has long been a model for its ability to solve its own distressing problems. The same problems arise here, and approximately,
we find the same history as of Michigan. The farmers, to a large degree, followed the logging industry, taking over the cleared land, or, in the better part of the state and near to prosperous communities, clearing land themselves.

Agricultural settlement no longer follows confidently at the heels of the lumberman as the forests are cut off. Cut-over lands become delinquent, agricultural land becomes delinquent, and so it proceeds.

Since 1920, only 20 counties gained land in farms, practically all of them were in northern central Wisconsin. Three areas began to lose farms in 1900. In the central sandy region where the growth of cities and urban uses do not account for the loss in farmland, over 187,000 acres have reverted since 1900. By 1927, delinquency had reached wholesale proportions. A study of the tax situation in only the 17 northern counties showed that 3,041,133 acres had one or more tax certificates against them from previous tax sales. More recent studies in certain counties show that tax delinquency is still increasing. By 1930, in Forest county, 71,856 acres had been added to the 121,944 delinquent in 1927. Another county held tax certificates against 35.9% of its total area in 1930.

There are 9,000,000 acres of forest lands which the most hopeful analysis excludes from possibility of private development. Already there are in round numbers 5,000,000 acres in various stages of delinquency.
There is a gross area of some 6,604,000 acres of land in Wisconsin which are critical from the standpoint of erosion and surface run-off. In a study made in 1928 by the Forest Service, it was found that within this gross area there are 3,397,000 acres of land which should be kept permanently in forest; 1,940,000 acres for protection against erosion; 75,000 acres for stabilization of bottom lands; and 1,382,000 acres for watershed protection.
AN ANALYSIS OF THE CAUSES OF REVERSION

Let us approach the problem from the two angles under discussion—Forestry and Agriculture.

Forest land may revert for the following reasons, or because these elements overbalance the more favorable ones:

1. The whole timber industry is in a turmoil over the taxation question. Some say that taxes are the largest contributing factor to delinquency; and some that it is a relatively minor point. This is not a place for or against taxation, but we will agree that it is part of the problem, a part which may tend to swing an ownership either to one side or another; Especially, when taxes amount to 83.4% of the carrying charges on 24 billion feet of non-operated timber properties in Washington for the years 1723-1927; though that amounts to only 2% of the total value of the investment, or about $0.39 per M. per annum on standing timber.

As has already been pointed out, in areas where farmland is unable to fill the treasury, the burden is thrown on the timberland. If the timberland cannot pay, the only answer is continued delinquency and, finally, reversion.

2. Carrying charges other than taxes is championed by many. I think we are all fully agreed that carrying charges do not mount up in units organized on a sustained yield basis, since the charges are paid out of the annual income. However, when the unit is too small for sustained yield management and successive blocks are cut over and caused to be idle; or where there is no annual income to pay the annual charges, we find a different problem. Chapman speaking of companies not on a
sustained yield bases, says, "No individual company can possibly carry accumulated charges at even 6%—because there is no operating income with which to pay these taxes." Carrying charges are important, then.

3. Repeated or heavy burnings cause timber owners to become discouraged and to relinquish hold upon land subject to fires. This would be particularly true in smaller holdings, or in older holdings where there are large areas of burned or cut-over land. The rapid exploitation and careless management of the timberlands has stripped the land so rapidly that many companies find thousands of acres of economically and physically barren land on their tax rolls. Usually, the large cost per acre of planting, and the large areas in need of planting in ratio to the amount which a company could hope to expend is too obviously unfavorable. Here, then, is another element.

4. Timber companies or small operators who have purchased holdings speculatively, without sufficient forethought about transportation costs, differences in quality of timber, shift in or location of markets, costs of logging on certain types of shows, and other similar factors determining marginal areas, have found that it will not pay them under existing conditions, their investment either partially logged, or even not touched.

5. We find even today a type of individual or individuals whose chief interest is immediate exploitation of a resource with no thought but their own immediate profit. Timber owners have long been classed among this type, until very recently when it has been found more profitable to have the opposite and more conservative philosophy. Many operators openly admit their policy of timber mining. Content to rape the
land, reap the timber, and then turn the land back to public ownership.

We find similar factors governing land reversion in lands under tillage or management of some sort for farms.

1. Farmland reversion is greatly increased in regions of rough, broken, or steep topography. In west Virginia, places where soil and topography were both unfavorable, the operators' land-labor incomes were, with few exceptions, low regardless of the personal characteristics of the farmer himself.

2. Coincident with topography, we find the farming of poor soil types a definite problem. Farms in relatively smooth topography may have been established on low, moist, river-bottom land, or low hill lands of clay or deep sand, or gravel - soils where crops cannot be grown profitably, or where the wrong kind of crop is being grown or grazing or other uses would be more profitable.

Farm abandonment is directly associated with poor or submarginal land. A study by C.E. Born shows how important soils are in determining the economic fate of a region. In an area studied, the following table was computed:

<table>
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<tr>
<th>Clay</th>
<th>Loam</th>
<th>Sandy Loam</th>
<th>Deep</th>
<th>Poorly Drained</th>
<th>Peat &amp; Swamp</th>
<th>Entire area Studied</th>
</tr>
</thead>
<tbody>
<tr>
<td>%</td>
<td>%</td>
<td>%</td>
<td>%</td>
<td>%</td>
<td>%</td>
<td>%</td>
</tr>
<tr>
<td>Tax delinquent 21.0</td>
<td>10.5</td>
<td>24.0</td>
<td>29.9</td>
<td>21.0</td>
<td>36.3</td>
<td>23.3</td>
</tr>
<tr>
<td>Public land 1.3</td>
<td>1.4</td>
<td>2.2</td>
<td>11.9</td>
<td>3.2</td>
<td>9.5</td>
<td>7.3</td>
</tr>
<tr>
<td>Held for sale 45.2</td>
<td>59.0</td>
<td>56.6</td>
<td>64.7</td>
<td>71.8</td>
<td>70.2</td>
<td>55.0</td>
</tr>
<tr>
<td>In agriculture 55.5</td>
<td>17.8</td>
<td>21.9</td>
<td>12.9</td>
<td>18.6</td>
<td>11.9</td>
<td>25.2</td>
</tr>
<tr>
<td>Farm land (abandoned) 11.0</td>
<td>12.5</td>
<td>15.8</td>
<td>28.4</td>
<td>16.7</td>
<td>18.2</td>
<td>15.5</td>
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Tax delinquency becomes progressively greater as one goes from the better to poorer soils. Only a small percentage of the better soils has reverted to the county.
3. In areas farther away from centralized communities, reversion shows a tendency to be heavier. Farmers established there some years ago feel the pull of the higher standard of living to be found nearer the cities, and show a tendency to leave the farms and move closer in. The migratory spirit is perhaps more pronounced in the younger generation who more readily heed the call of the cities, the universities. The result is a great turn-over of farm property and the inevitable reversion of some of it. High per capita taxes for benefits enjoyed in isolated districts increased this tendency.

4. Farms established in timbered areas may revert for any of the above reasons, but we may safely say that they would tend to meet the other conditions more readily.

5. In localities where, as in Michigan or West Virginia, or the Northwest, the farmer finds the timber lands gone, his own farm wood-lots barren, the burden of taxation falls upon him. And if no amount of crop acreage is at hand, if there are no other markets, or other type of work off the farm, the farmer must leave his farm, or be willing to do without schools, roads, and the like. He invariably chooses the former course and becomes a nomad farmer.

6. In areas where there is only a small acreage of a particular soil type, the farmer finds himself beset with several of the above conditions.

To summarize the conclusions regarding reversion, we find, that it takes place in:

A. Forest land - when

1. Taxes are prohibitory, because of excessive state or county costs, or because of some inherent ailment in the tax.
2. Carrying charges are excessive - when company is too small to hope to remain on or maintain a sustained yield.

3. In heavily burned or repeatedly burned areas; or where there are vast logged areas with little or no reproduction.

4. In submarginal areas, where transportation, or logging costs are excessive.

5. Investments plainly speculative and which the owner had no intention of holding after logging.

B. Agriculture lands - in

1. Rough, broke, or steep topography.

2. Low, moist, river-bottom land or low hill lands of clay or other poor soil types.

3. In areas farther away from centralized communities; on isolated farms.

4. Where taxes are high because state and county costs are high with withdrawal of timber interests and overlogging.

5. In places where the wrong products are being raised and where grazing or other utilization would be more profitable.

6. In areas where there was only a small acreage of soil type.
LAND OWNERSHIP AND POLICY

I believe, that if we examine the present system of land ownership, the philosophy which attends it, and its growth, we shall find that this system (or lack of system) is largely responsible for the present chaos in both industries.

The present system of land ownership is characterized by very evident lack of thoughtful planning or foresight - as regards both forest and agricultural lands. We have only to glance at the conditions of the lands themselves to see the truth in this statement. Anyone can own forest land whether he is prepared to keep it productive or not; whether or not he knows even the rudiments of economic logging or management; whether or not he has also the interests of a county, a state, or the nation at heart; whether or not (with very few exceptions) the land is in a critical locality with regard to watershed protection, stream control, recreational value, game and wild life value, or other values which should determine the exact use to which a stand or stands should be put.

Land companies using near fraudulent methods, with little or no thought to actual land use - value, have sold millions of acres to relieve timber companies of worthless cut-over land, and counties of already proven non-agricultural land or even marginal or sub-marginal timber land.

People of non-proven farming or logging ability have been the victims snapping up the bait - usually city bred. There are few agencies to which a prospective land owner can turn to find the best use to which his land could be put; where best to grow his particular specialty.

True, we have university extension services who are doing a noble, but not quite hearty enough work. We have laws governing the amount that shall be spent for fire protection on timber lands; laws permitting re-
forestation on a cooperative basis; laws to permit the buying up by
states of already delinquent land; but these are mere beginnings —
their effect is hardly noticeable.

What is there to prevent a man from buying a good grade, say, of
Dayton land in the central Willamette valley, except his own judgement
or that and advice of friends if he is not a stranger? Nothing.

The philosophy responsible for the present system of land ownership
is a magnificent relic of the days of Westward expansion; a gesture of
a growing people and an expanding nation. The philosophy is the stepchild
of the old philosophy of limitless resources and the fiery "Lasse Faire"
policy advanced by hugely profitable concerns for obvious reasons. Per-
haps the Yankee love of individualism with a capital "I" is an element.
Who has not heard the famous "This is mine and I'll do what and when and
wherever I want to do with it, and it is absolutely no one else's busi-
ness but my own?"

Trial and error could very easily be set up as the descriptive phrase
of an examination of land ownership growth. Thru costly trial and error,
abandonment and tax delinquency, we now and an "idea" where submarginal
lands are. The story is told that President X was discovered by a na-
tive of Wisconsin lowering a thermometer into one of the northern lakes.
"What are you doing?" "Getting the temperature of the lake to see whe-
ther fish will live in it or not." "Why the h--- don't you put a fish
down there to find out?" That is exactly what we have been doing. We've
put settlers on land, and if they lived, we concluded they were on good
land, and if they moved off, we too often said the land was O.K. but the
settler poor, until enough fish had died to prove the case.

Such a condition is permissable in a new, unstabilized, rapidly,
growing nation. But once a condition of stability is reached, a new policy must be advanced.

When the pilgrims landed, it became necessary to literally fight the forests for possession of the land; no one was restricted in the size of his plot so long as encroachment on another's property did not happen.

The same is true of the three waves of Westward expansion and subsequent development.

A seemingly ever-increasing demand for lumber and food products resulted in the philosophy that "there could never be too many farms," and "we will always have this wonderful market for timber."

The public land policy has an interesting, if lurid, development. It seems to be a history of getting the land into private ownership in the briefest possible time. The actuating motives have been variously described, but I believe that, with all, it has been the drive for the creation of individual wealth and power, for increase in population and consequent national power. Whatever Congress did or did not do, "one may credit --- it --- with the idea that national development would be promoted, regardless of the motives which certain individuals of Congress may have had."

It was not till 1841 that we find Congress endeavoring to regulate the use and sale of the public land. Up till that time, sales of the public land could be made in unlimited amounts, and one such sale was for 822,000 acres at $1.00 per acre or less. At first, as in the history of other countries, the land was given in lieu of a pension to the nation's soldiers in tracts of 160-640 acres each. After the Act of 1841 (Preemption Act) we have three resultant acts which "Div-
closed a distinct trend toward the use of public land to secure actual settlers. The Homestead Act placed 228,742,000 acres of land in private ownership (1927); the Desert Land Act - 133,800,000 acres.

Land grants form an important background for a study of the growth of a land policy. With the impulsive generosity of Youth edged on, millions of acres were deeded to various improvement organizations. The railroad grants placed 130,994,000 acres in the hands of Railroad corporations. No provision was made for their proper use. Educational grants (the least objectionable) placed 69,000,000 acres into the hands of states or school boards for common schools. Land grant colleges received 30,000 acres each and later universities 46,000 acres each. A total of 89,000,000 acres.

Such a haphazard system, successful as it was in securing settlers, was not effectively controlled; graft and corrupt practices were common; and it resulted in certain things which have led to our present land status. These things are:

1. It caused a degeneration in the morals (ethics) of the people, particularly in their attitude toward public property.

2. It made possible the creation of large holdings, many by dishonest means.

3. It placed one natural resource, at least land, in such a condition that it could be exploited with no consideration for the present or future welfare of the nation.

4. There was no provision for proper use.

And what do we have today? - Cut-over, immature, and mature virgin timber going out of the hands of the owners. Millions of acres of good farmland lying idle while millions of pseudo-farm lands are not even
paying taxes. We find a migration of farmers from the east to the Mississippi valley - millions of acres that should never have been cleared (20,000,000) washing away at the rate of 100,000,000 cubic yards per year; timber companies still trying to sell (and doing it, too) doubtful cut-over land thru the various land companies; vast irrigation and reclamation projects proposed; and a lot of talk and pow-wow about doing things to remedy the situation - when no-one seems to know where the key is.
ZONING - THE SOLUTION TO THE PROBLEM

Zoning is a physical, economic, and social division of land into areas which have the greatest use value based on physical, economic, and social demands on the one hand and qualifications of the land on the other. Zoning is an attempt to establish a balance between these demands so that the ratio between them is as near to 1-1-1 as possible. Oftentimes, it will be necessary to judge a questionable area from the sociological side alone, or again the physical side. In other words, any group of factors under any one of the above classifications might determine the ultimate worth of an area.

Zoning is constitutional, and it is growing in use and recognition every day.

HISTORY OF ZONING

We find that some forms of zoning have been practiced for many years, and a certain natural zone-growth has appeared to a certain extent because of the grouping together of co-industries and the natural selection of, say, agricultural areas, thru trial and error, little has been done on an organized, scientific scale until recently.

Zoning at first was introduced in its more spectacular and large scale use in the larger cities, - Los Angeles, New York, and St. Louis, and was confined to urban problems such as excluding obnoxious manufacturing plants from residential or medical areas; limiting the height and mass of buildings in certain zones.

Later, as its use increased and its value became more apparent, a system of regional or county planning in addition to that of the city was advocated. We find Los Angeles coming to the fore as being the county where county zoning was first officially recognized and begun. Milwaukee
county, Wisconsin, soon followed suit, and about the same time similar
recognition (though not official) was given it in the New York region.
This era marks a very important step forward in zoning.

Finally, we find the idea of state zoning being advocated.

There are two distinct periods in the history of zoning. The first
was devoted to the problem of proving and establishing the validity of
zoning as a police power under the constitutional law of the United
States and the rural states. This period was characterized by many
bitter law suits which finally carried the problem to the Supreme Court
of the United States where zoning was declared constitutional. This is
perhaps the most important step forward. The problem which remained was
one of education, discussion, and planning.

This, the period coming second, seems to center its activity around
the problems of administration with economic, political, social, and
aesthetic considerations. Economic and social elements should be con-
sidered first, and we find that this is the case, except that a few cases
of aesthetic zoning have been executed, particularly along highways and
scenic routes.

The Modesto Ordinance of Modesto, California passed in 1885 restrict-
ted the location of laundries in the city. This was probably the first
recognized zoning ordinance.

The most real advance was made in New York in 1916 - marking a new
era in zoning practice. A comprehensive zoning ordinance, including
maps (the first) and other special elements was introduced. Los Angeles
made the next big step in 1921 when a comprehensive zoning ordinance was
passed including measures to protect home areas from encroachment by more
intensive property uses.
The practice was contagious, and soon we realize that there is scarcely a city of any size or self-respect in the United States today without a zoning ordinance. There were many abuses, and political schemes, but this was no deterrent and we find it gaining favor rapidly.

Los Angeles county was the first county in the United States to have an official planning commission, and under its charter powers has had a land use ordinance in effect since 1927, applying detailed restrictions on pronounced urban localities and dividing the county into 3 districts and 10 subdistricts. These are:

1. Residential -
   a. Single family residence zone.
   b. Two-family residence zone.
   c. Limited multiple residence zone.

2. Commercial -
   a. Apartment and restricted business zone.
   b. Neighborhood business zone.
   c. Unlimited business zone.

3. Manufacturing -
   a. Factory zone.
   b. Industrial zone.
   c. Unlimited zone.

Milwaukee county, Wisconsin, had in 1926 a zoning ordinance drafted to cover the entire county. It provides use regulations only and includes as one item — an agricultural district. (the first). They are:

1. "A" residence district (single and two-family dwellings.)
2. "B" residence district (apartments and hotels.)
3. Local business district.
4. Agricultural district (to permit manufacture of dairy prod.)
5. Commercial district.
6. Industrial district.
7. Unrestricted.
Glynn county in Georgia went a step further in zoning the agricultural district. It covered - "dwellings incident to agricultural uses and farms for timber, grain, fruit, vegetables, or livestock."

The latest\textsuperscript{12} and most concrete advance in actual direction of land use is the county zoning law enacted in Wisconsin in 1931. The county board is given authority to regulate, restrict, and determine the areas within which Agriculture, Forestry, and Recreation may be conducted. It may dictate the location of roads, schools, trades, and industries. It may compel abandonment of an agricultural use in a forestry area, so far as this is necessary to accomplish the objective of the zoning law. Exchanges of land are permissible in order to consolidate farming areas. Voluntary land exchanges have actually been consummated. Numerous county forests, operated with technical and financial assistance by the state, have been organized.

So we see that zoning is an outgrowth from an attempt on the part of municipal authorities to prevent uses which, while in themselves are not nuisances, might be nuisances if not properly located, developing from city to county planning. The first Agricultural recognition seems to be in Los Angeles county with the use restricted for manufacture - clearly an urban classification.

Glynn county, Georgia, shows a real step forward when it includes buildings for agricultural uses and farms for timber, grain, fruit, vegetables, or livestock. And, finally, the latest step by Wisconsin is to provide for the program on a large scale. This progress indicates an advance into the "unlimited" districts of the more clearly urban classifications, but it is doubtful whether the basis for classification considered anything more than the protection of the city — with no soil...
veys or recommendations until Wisconsin's latest step. It is in this "unlimited" district that we will find our problem, for it deals with the areas outside the cities, - forests, farms, etc.

The first faint glimmering of a national attitude is expressed in a few legislative measures. The Week's Law which tended to formulate a use program for submarginal farmland was probably the first of these that has outstanding importance.

FUNCTIONS OF LAND ZONING

These were taken from a discussion of the functions of zoning as applied more particularly to urban zoning, but I believe they apply equally as well to the rural and subrural districts. I have added some of my own ideas and omitted some given which applied more specifically to urban districts.

Social Functions.

1. Control of distribution of population and intensity of land use.

2. Prevention of blighting of districts, through continuity and homogeneity of development.

3. Facilitation of more equitable distribution of social and recreational opportunities in harmony with local and well fixed needs.

4. Encouragement of permanent investment - with its attendant effects upon citizenship.

5. Development of community "esprit du corps."

6. Tendency to attract specific labor types, building up the community.

7. More equable distribution of better lands, and resulting raising of farm-labor incomes.
Economic Advantages

1. Possibility for more rapid ripening of existing land values.

2. Economy in county, or state, road, school, or other improvements due to fixed and predetermined needs established by zoning.

3. Possibility of economical land planning according to predetermined zones.

4. Avoidance of depreciation in land values, due to permanency of development.

5. Removal of hazard arising out of land speculation where zoning does not exist.

6. Greater confidence in land investment due to permanency of development.


8. Possibility for a more equitable classification of taxes for improvements, thus relieving the urban (or rural) property of all tax burdens which do not directly benefit the urban group.

9. Removal of property losses due to assessments for improvements which leave no relation to specific group or district needs.

10. Possibility of introducing better paying uses for land, or introducing new uses.

11. Permits closer and better organization of farmers cooperative associations - facilitating marketing, etc.

Community-Wide Advantages.

1. Segregation of community functions (rural from urban) from residential districts.

2. Less complexity in matters of regulation, law enforcement, etc.

3. More natural distribution of land uses among various political units in a region.

4. Greater possibility for broad planning schemes free from the evils of shifting land uses.
5. More scientific distribution of population in relation to community functions such as industry, business, and recreation.

6. Greater accuracy in calculation of community needs, with resulting stability and greater economy in cost of development.

7. Possibility of acquiring non-agricultural zones for community parks, recreational areas; community managed wood-lots, etc.

8. Will insure protection of county, or municipal watersheds. (Portland Bull Run watershed an example.)

9. More extensive and intensive community legislation and improvements can be obtained because of their confinement to smaller organized areas, and resulting lower per capita cost.

Special Advantages.

A. Timber interests.

1. By blocking or concentrating the timber land, it will enable better regulation and management.

2. Will encourage concentrated, organized action to build up forestry.

3. Will encourage sustained yield management.

4. Will tend to stabilize the industry by creating a base upon which to plan and build, as management, marketing, etc.

5. Prevent entrance of settlers and consequent raising of taxes thru road building, schools, etc.

6. Easier to obtain definite legislative action if necessary, if definite zones are established and certain industries concentrated rather than scattered.

B. Agriculture interests.

1-6. These same advantages as those for timber interests.

Zoning would tend to accomplish these results with any type of community; and if we look closely, we will find that the following groups or classes of land should be zoned out:
A. Agricultural land - into land for
   1. Crops of various sorts,
   2. Dairying or grazing of small local herds of cattle, sheep, horses, etc.

B. Forest land - into land for
   1. Watersheds and flood control at heads of streams.
   2. Timber growing, and logging.
   3. Grazing or range land for large herds of sheep, etc.
   4. Recreational uses - parks, areas above timber line, and home sites.
   5. Water power uses and grants.
   6. Waste areas or areas in need of intensive protection such as the areas subject to heavy erosion, sand dunes.
   7. Other special areas.

C. Areas where both farming and logging can be carried on together, either with farm wood-lots or forest areas blocked out to afford farmers work in winter and other slack times.

D. Urban and semi-urban areas. The latter to include areas along roads near centers of community interest.

HOW TO OBTAIN ZONING

Those who question the legal right of the county to regulate private land uses forget that what the county now seeks to do is fundamentally what over 400 cities are already doing. In the United States today, there is scarcely a city of any size or self-respect without a zoning ordinance. Forty million city dwellers, whether they realize it or not, are living under regulations governing the uses of private property. (Regulating Land Uses in the County, Annals of the American Academy, May, 1931)

Zoning may be obtained in two ways, namely:

1. Non-legislatively, and
2. By legislation.

Non-legislatively - In many states, legislation of any sort is a slow and tedious process, and this element, combined with the opposition which zoning on a large scale would undoubtedly meet, would tend to dis-
courage it. There are ways, however, in which the effect if not the figure of zoning proper could be attained until such time when the needed legislation is passed.

Sales of sub-marginal agriculture land should be discouraged. Under this group, of course, is land that has not yet been under the plow, land that has reverted and is to be sold for taxes, and finally, habited farms where the owner's only desire is to get rid of his farm at some price. A group of serious, public, minded, individuals to make up the local governments could obtain results:

A. By causing local bodies or even influential individuals to become interested enough to make the necessary preliminary surveys. There would be, at best, frugal and not permanent, but would certainly be a starter. Such surveys would show where the most desirable land is within reasonable limits.

B. By the following:

1. A frank talk with the present owner laying the public's cause clearly before him and asking him to desist;

2. Refusal to accept deeds to the public dedicating certain rights of way for road purposes;

3. Refusal to record certain plotted sub-division when, in the opinion of designated officials, the lands so dedicated are unsuited to agriculture use;

4. Notice to present and prospective owners that it is not the intent of local government to provide roads and schools for this area at public cost. That owners and settlers will be expected to furnish their own rights of way, to build and maintain their own roads, and to pay all costs in cash for the education of their children, over and above what might be determined as a normal or average cost, to be collected in taxes;

5. Enlisting the interest of the press, or responsible groups of real estate dealers, of Chambers of Commerce, and other associations.
6. Enlightening the people generally;

7. Refusing to sell reverted land, in county or state possession - allowing such land to block up until sufficient area is obtained for either administering as a forest or other use areas, or going in to existing private or public forests or other use areas.

By Legislation - Where legislation is direct and forceful, power may be given to the state or county.

A. Surveys are the first step, and it becomes necessary to obtain the necessary legislation and appropriations to carry on the work. County budgets may find difficulty financing such a project, so that it would be the best plan to obtain state aid on a percentage basis, or else introduce the project as a state project to be carried on by the state in the various counties with their assistance. Of tremendous aid in planning such survey work are county records. There should be some state regulation which requires that all counties always have to date -

1. Ownership maps showing
   a. Delinquency status;
   b. Areas in farms, in grazing, and in timber;
   c. Road improvements permanent and proposed; and
   d. Location of schools.

2. Summary sheets showing
   a. Acreage in farms, in grazing, and in forests;
   b. Acreage delinquency status by townships; and
   c. Occupation.

With such data as a basis, and with soil surveys and soil maps, topographic survey maps, a study of relative incomes and sociological conditions, an economic survey can be made by which land classification and subdivision can be made, and recommendations follow.

B. Further legislation is necessary now to utilize the results of the surveys. The present reforestation laws are the faint beginning of such a movement. Such legislation, either state or county or both,
should include:

1. Creation of a board of land examiners (state and county) to pass on all future land use. To have power to restrict use; to block up county or state land; and to establish zones.

2. Refuse to allow settlement on certain land types as shown outside the agricultural zone on a map made by responsible officials.

3. Make it possible for the county or state to trade good land owned by the county located near established roads and schools for this poor land; moving the settlers at the county's expense.

4. Purchase or acquire thru condemnation proceedings sterile areas where public service costs approach value of land.

5. Make it necessary for new settlers to have their prospective use of their land reviewed or judged by appropriate officials or a board especially created for such work.

6. Remove existing county boundaries, consolidating two or more counties into one when the area of non-agricultural land makes it certain that taxes are not sufficient to cover the costs of present county government.

7. Make it necessary to justify road locations and schools before such action is recognized by existing governments.

8. Possibly confiscatory taxes in certain areas to hasten delinquency; to cause certain areas to be blocked up under state or county control.
CONCLUSION

The problem naturally divides itself into three responsibilities -

1. The responsibility of the counties;
2. The responsibility of the states; and
3. The responsibility of the Federal Government.

The responsibility of the counties can be met by working with the state to accomplish an effective, active program of wise land use. Counties must determine and establish definite policies for use, determined by surveys. Counties must block up certain areas of non-agricultural land. This they can hold themselves, or turn over to the state or Federal Government. Counties must be responsible for the proper workings of their policies to the state.

The states may work on a basis similar to the county - offering assistance to the several counties; compiling state-wide data; establishing state zones, if possible; hold the counties to their responsibility, and where this is not assumed, step in and act. The states should take over much of the blocked up land that the counties will be unable to carry. The state must see that Federal assistance is at hand; federal advice, etc.; financial aid and legislation to the counties for surveys. The state is responsible to the Federal Government for the counties and state.

The Federal Government must assume ownership of the lands which the states can not or do not desire to carry; to assist in blocking the land up; to give financial and legislative assistance to the states.
Fig. 1

--- Limit of financial control 

- physical timber line

--- merchantable timber line (upper margin)

--- merchantable timber line (lower margin)

x line of marginal agricultural land

----- devoted to recreation, grazing, mining;

----- devoted to stream control, watershed protection, recreation, grazing, summer home sites, wilderness areas;

----- timber growing for logging; some watershed protection, some parks, wildlife, scenic sites;

----- hunting or game reserves; managed recreation areas, parks; some grazing; farmstead lots in conjunction with farms; areas held for prevention of rapid run-off 

----- farms; grazing; urban; farms restricted 1/2 mile outside this line.
Figure 2.

Showing how agricultural areas may be blocked out, with the establishment of all farms restricted within this agricultural zone, as shown by the green, . The other areas are capable of growing crops, but for economic, sociological, and other reasons not open to settlement. Such areas have in the past been settled, but distance from markets, high taxes due to the amount of county improvement in proportion to population, and other reasons given, have contributed to cause delinquency and reversion. Because of the small percentage of agricultural land outside of the green, its use should be wholly developed from other standpoints—timber growing, recreation, grazing, or other uses. If the contiguous area shows only a small percentage of agricultural land, i.e., the green being only a small arm of agricultural land; perhaps that area should not be developed as agricultural, or should not be open for settlement. (There are many such areas.) unless areas like those blocked out in brown are several and have farms going delinquent. Then it would be a good plan to concentrate the delinquent farmers with small farms on the green areas; or move them farther out and use such locations for permanent logging settlements, etc.
What a soil map might reveal: the one type well fitted for cropage, the other not suited for cropage, but better fitted for pasture or dairy land. Such a condition as above might deadlock the uses to which such an area could be put—especially if under single ownership. If under two or more owners, however, the use could be restricted to the proper one by restricting the division of the land. A single owner could operate half of the area for crops and the other half for grazing; or depending upon the ratio between the two, put the whole thing either to crops or grazing. This ratio could be shown graphically.
The greatest difficulty will not be the determination of the physical boundary of agricultural land, because that has more tangible factors governing it. The difficult part will be the determination of the economic marginal line, principally because this is a fluctuating line—never remaining exactly the same from one year to the next. This difficulty might be overcome by determining the maximum and the minimum lines beyond which this line has not yet fluctuated, and establishing the economic marginal line midway—allowing a certain amount for fluctuations—based on the past 10 year period and present trends.
Since these areas are definitely known, and since it is estimated that erosion costs North American farmers about $200,000,000 a year, it would seem more unreasonable that definite action not be taken. If these areas are zoned out and particular steps taken to remedy the situation within the zones, the situation would be bettered. These steps are:

1. Restricting farmers from certain areas;
2. Restricting uses in certain others;
3. Setting up minimum precaution measures within certain areas - much as logging companies must by law observe a minimum of fire protection measures; and
4. Blocking up others of the more advanced stages for public ownership and management.

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The gravity of the situation is great enough that it can no longer be shrugged at. Definite action of a nationwide character must be forthcoming, and that action could but follow the trail blazed by the few pioneer states, counties, and cities.

Perhaps, as when definite areas of large acreage and no money sure value or special use value at present are known, the planning of zoning should assume a National status. (See figure 6).

At present, there is a tendency for logging companies, states, and counties, to sponsor "back to the land" movements for the express purpose of "passing off" land. This should be curtailed.

The Federal Committee on Land Use should recognize the necessity for quick action, and should work now directly with the states, possibly thru the departments of Forestry and Agricultural Economics, with state colleges and the granges, and lumber industries on the outside.

It is a problem which calls for mutual cooperation and understanding based on the true light of facts, and without petty political, or other partisan grievances which block definitely progressive and beneficial action.

As I have said - there is no one solution; there must be adjustments and changes in any plan; but perhaps this would be a beginning.

Respectfully submitted,

H. O. Stewart.
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