

SURVEY AND INTERPRETATION OF SIGNIFICANT RECENT CHANGES
AND TRENDS IN THE ECONOMIC AND HUMAN GEOGRAPHY
OF THE UPPER WILLAMETTE VALLEY

by

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A THESIS

Presented to the Department of Geography
and the Graduate Division of the University of Oregon
in partial fulfillment
of the requirements for the degree of
Master of Science

June 1942

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TABLE OF CONTENTS

	Page
INTRODUCTION	1
Chapter	
I. PHYSICAL REGION DEFINED	3
Topography	
Hydrography	
II. POPULATION	15
III. LAND USE, AGRICULTURAL	21
IV. LAND USE, FORESTRY	31
V. INDUSTRY	37
VI. TRANSPORTATION	41
VII. ELECTRIFICATION	44
VIII. RECREATION	47
CONCLUSION	50
BIBLIOGRAPHY	54

LIST OF ILLUSTRATIONS

Figure		Page
1.	Ground water Distribution	9
2.	Hydrography of the Upper Willamette Valley. . .	14
3.	Approximate Population Distribution	19
4.	Rural Population, Urban Population Distribution	20
5.	Agriculture graphs	29
6.	Approximate Location of Sawmills	35
7.	Number of Sawmills	36
8.	Soil map	55
9.	Land Adaptability	56
10.	Base map	57

ACKNOWLEDGMENT

There are several people who greatly helped in the completion of this work. To them the writer is deeply indebted. Among them are Dr. Warren D. Smith, James Stovall, Dr. W. L. Powers, Mr. Brenne of the Eugene Chamber of Commerce, Dr. Mason of the Oregon State College School of Forestry, Mr. Northrup of the Eugene Water Board, Mr. Andrews of the Regional Forestry Office, and many others. All of them were willing to discuss problems most courteously and patiently.

This work has drawn generously from, and has been generously aided by, the Oregon State Planning Board, Oregon State Agricultural Experiment Station, Regional Planning Commission, State Highway Commission, Social Security Board, Oregon State Employment Service, United States Bureau of Census, Bonneville Power Office, etc., all of whom deserve heartfelt thanks.

Notwithstanding this great amount of assistance, culmination of the work with adequate answers was made possible only through extensive travel experiences. All points in the area having any vital connection with the human or economic geography of the region were visited, entailing approximately 2000 miles of journeying. On these trips observation was supplemented by interviews with many people whose names space does not permit mention to be made.

Last of all, thanks must be extended to those who critically read the manuscript, alleviating errors and offering constructive criticism. It is hoped that all these aids have made this thesis fairly accurate and valuable as a source for more adequately interpreting this region to the best interest of all concerned.

INTRODUCTION

The main purpose of this study is to ascertain recent changes in the economic and human geography of the Upper Willamette Valley and interpreting these changes in the light of socio-geography.

This study is important because new peoples, industries, and other developments are coming to the region and disrupting the status quo. A survey of changes and trends is necessary to impart a workable bit of knowledge to assure more effective planning along lines based upon natural and artificial advantage. So far very little correlated work of this nature has been done here except fragmentary phases by the Regional Planning Commission and the State Planning Board.

In the thesis the problem mentioned above has been attacked by extensive interviewing of selective nature, travel, observation, and correlation of pertinent published material. These findings, after thorough evaluation, have been related to the main problem.

The main purpose in regional planning is to facilitate the economic use of a region's resources according to the laws of advantage wherein all gifts are utilized in a way to obtain greatest returns possible. In so doing the area in question is assured of the highest living standard possible from its resources. Such a community assumes the status of being an asset to the national organization rather than a liability. From the foregoing it is evident that the development of the whole area should be balanced rather than being thorough only in specific, uncorrelated phases.

Regional maturity is said to take place when all the resources of a region are fully used to the best advantage of those concerned.¹ It might be interesting to notice to what degree that is true here. However, since sound growth into maturity requires a full knowledge of the resources of an area and of its environmental forces, it must follow that this region hasn't attained maturity because knowledge of the preceding step, of its resources and environmental forces, is incomplete.

According to the National Resources Committee regional planning which has hope of accuracy of fulfillment of a predetermined plan must of necessity be largely restricted to physical problems like irrigation, roads, flood control, public works, and questions affecting conservation and development of fisheries, forests, minerals, etc. Mobility of population within our country makes that phase extremely difficult to interpret for specific regions; however, population problems dealing with economic level, rural-urban ratios, and nationality make-up can be studied with a fair degree of accuracy. With these limiting factors in mind changes and trends of the area have been surveyed.

¹ Oregon State Planning Board, Willamette Valley Project (Portland: Works Progress Administration auspices, 1937).

CHAPTER I

PHYSICAL REGION DEFINED¹

Topography

The physical boundaries of the Upper Willamette Valley are the summit of the Cascade Mountains on the east side, the Calapooya Mountains on the south side and the astronomical boundaries of Linn and Benton Counties on the north side.

The valley proper is much older geologically than its peripheries. In fact, the valley has those characteristics of topography known to geologists as "old age." For example the stream pattern is somewhat dendritic; there are Yazoo streams; the master stream has built natural levees, etc. Some of the mountain areas on the periphery are very youthful in comparison, although those Tye sandstones on the west are older than late Tertiary basalts on the east. Nevertheless valley rocks antedate both of them. The bare lavas of the upper Cascades are, however, only a few hundred years old; stream patterns are hardly established, and lateral cutting has hardly begun. It will suffice to state here that the earlier stages in the geological history of this valley were largely marine with sediments chiefly sandstones and shales laid down not very distant from great masses of igneous rocks and that these

¹ Oregon State Planning Board, Willamette Valley Project (Portland: Works Progress Administration auspices, 1937), pp. 40-53.

sediments show considerable intermingling of volcanic fragmental material.¹ Sediments formed under these conditions lack lime, and it must be supplied for certain crops.

Geologic history since Oligocene time has been confined primarily to normal aggrading of the river and glacial filling of valley areas; thus many soils are yet very young.

The Willamette River didn't make the valley. The valley antedates the river. "The Willamette River developed through stream capture and headward erosion from the Columbia."² As for the valley itself, it is a structural type consisting of a trough sloping to the northeast and abutted against the Cascades where newer basalts and andesites overlie Oligocene rocks. In later times the trough was filled by erosion and the rivers began to build their flood plains.

A well developed system of tributaries laden with sediment now accompanies the Willamette River. The master stream at present has reached temporary base level because of the falls at Oregon City. Should these be eliminated the stream for a time would again assume more youthful behavior, to a very limited extent.

¹Oregon State System of Higher Education, Physical and Economic Geography of Oregon (Printed in United States of America, 1940), p. 36.

²Oregon State Planning Board, Willamette Valley Project (Portland: United States Engineer Office, 1940), p. 41.

Although the general northward slope is about three feet per mile, the relief is by no means monotonous. Variety is added by certain lava intrusions. For example, in the area there are Skinner's Butte, Spencer's Butte, and the Lebanon Buttes.

Willamette Valley soils are divided into several series based upon various chemical constituents, physical locations, and geologic age. First, there are recent alluvium soils on stream bottom areas. They are a young group, unleached, and well supplied with lime and magnesium. Next, there is older valley filling located on higher land. It has moderate lime and magnesium content and needs additional liming to counteract acid reaction tendency. Last, there is residual soil on the highest land. It is acid and low in phosphorous content. Nitrogen and organic matter are moderate. As a summation to the chemical constituents of the soils it might be said that phosphorous content is good, potassium is good, nitrogen is variable, and sulphur is low in several series.

Old valley fill is most important from the standpoint of man. On it many of the best farms are located. It has good drainage, high fertility, is irrigable, and is plentiful. One of the residual soils, Melbourne Series, has many of the same positive characteristics.

The valley fill referred to above is located on Oligocene shale which is in part marine formation. It is composed of gravel, sand, and silt irregularly distributed and of variable thicknesses. The shale itself is a mixed marine-terrestrial rock of Tertiary time.

There is little promise of great ore deposits because of an extended

cover of deep andesitic lavas.¹ However, gold, manganese, and mercury have been found in the Cascade region. In the fracture zones in the andesites and basalts in the east and southeast pyrites, chalcopyrites, sphalerites, galenites, malachite, stibnite, and cinnabar are found. There are apparently no ore bodies to be found in contiguous areas of the Coast Range Mountains.

Of the non-metallies refractory clays are probably the most important. Brick and tile plants have been established at Monroe, Corvallis, and Quartzville to process these clays.

Climate is of the transitional Mediterranean marine variety. During the summers a Mediterranean type drought is modified by some rain. Also, the marine influence lowers the average summer temperature and raises the average winter temperature. From the foregoing it is evident that no extreme variations in temperature are experienced. Rainfall is approximately forty inches per year. However, the preponderant amount of precipitation does come in winter. Even with the marine influence affecting the summer rainfall regime, there is often a sad deficiency of moisture during the growing season.

The Upper Willamette Valley should have about fifteen more inches of rainfall during the two hundred day growing season to assure optimum results.¹ That in itself is one good justification for inception of the Willamette Valley Project which will supply supplemental irrigation.

¹Oregon State Planning Board, op. cit., 1957.

Natural vegetation of a region is a direct response to a long-time interaction of such factors as mountain barriers, prevailing winds, nearness to the sea, and those other factors which make up climate. These factors interact here in such a way that precipitation is extremely heavy in the mountain areas adjacent to the valley proper. As a result, there are dense forest growths. In fact, nearly three-fourths of the drainage basin is forest-covered. Most of this timber is Douglas-fir. Hardwood stands are unimportant, accounting for barely five per cent of the stand of timber. Oak is used moderately for fence posts and fuel, and red alder is used to a certain extent for furniture according to Oregon State College sources.

Hydrography

The Willamette Valley is really a reservoir. Its sides and bottom are volcanic rocks and sedimentary ones, respectively; the floor is covered with sand and gravel.¹ These sands and gravel in certain areas have high water-yielding capacities.

There are several types of areal ground water occurrence. First, there is recent alluvium where the ground water level is very sensitive to change in the river stage. Next, is old valley fill where water-yielding capacity is moderate over a fairly extensive area. Last, there are high areas where ground water capacity is low. Also, the yield is low

¹Ibid.

and uncertain.

In many instances the supply of ground water in recent alluvium is excessive making drainage necessary. However, it is a sad commentary that drainage operations have lagged far behind the need.

Recently a Federal-State cooperative study of the ground water resources of the Willamette Valley has been made under the direction of A. M. Piper. The study was extensive and complete and is now in press. It revealed that annual ground water charge is great; it amounts to about 500,000 acre feet, but the areas charged receive varying amounts and have a patch-quilt pattern as to location.

Among specific findings are that the old valley fill has a good supply of ground water in lower reaches of the valley but decreases toward Eugene because the water-holding layer becomes thinner. In other areas the water has a tendency to be saline; many dry holes are found near Junction City; gravel content is slight around Lebanon and the ground water supply is meager as a result. The upper terrace has a very uncertain supply that needs exacting control if used for supplemental irrigation.

From these recent findings it appears that there is a sufficient ground water supply for a great deal of supplemental irrigation. Of course, if all the annual charge could be utilized, a quarter-million acres could be irrigated, using two acre feet per acre. However, much of the charge readily seeps into the Willamette River as run-off diminishes and as a consequence can't be salvaged for irrigation. It would cost more to pump this water on to the farms than it would cost for

Groundwater Distribution

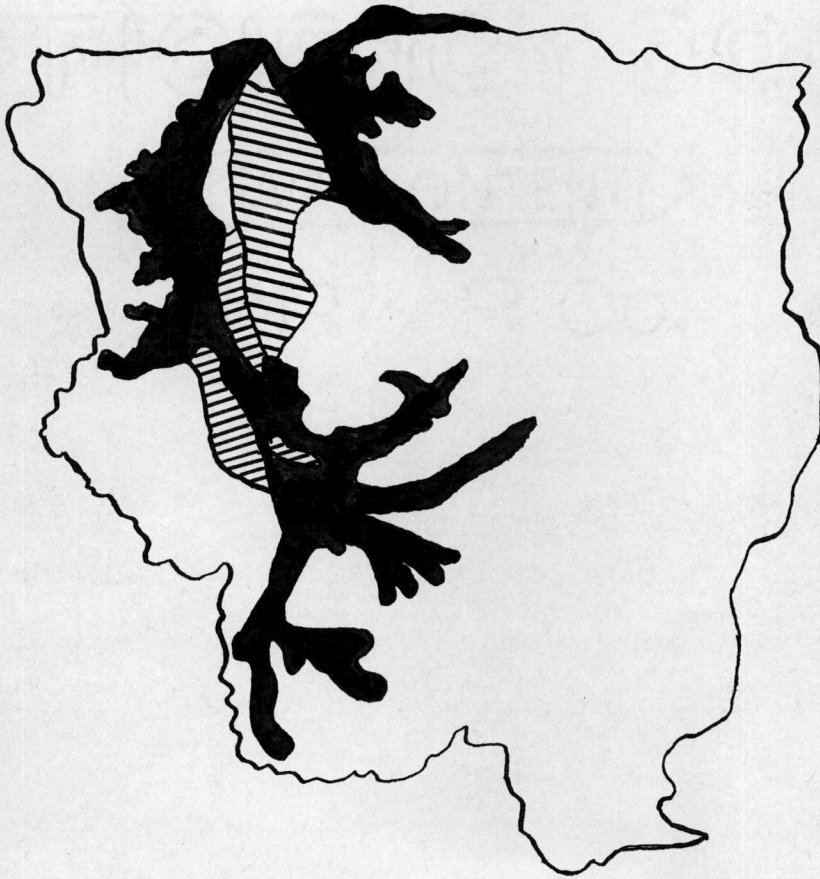





Figure 1

Legend

-  Groundwater assurance high
-  Groundwater assurance fair
-  Recent alluvial soil

gravity irrigation from the Willamette Valley Project. Nevertheless, it will be safe to supplement gravity supplies of water, or even irrigate certain areas not otherwise irrigable.

The Willamette Valley Project has been mentioned before. Its need to a great extent came from a most serious aspect of the rainfall problem. There are many steep slopes and denuded areas which expedite run-off. This results in a flood menace during the rainy season. In the summer, of course, the opposite is true; there is a drought danger. Before inception of the aforementioned plan little had been done to modify seasonal distribution of rainfall by storage. The main stated purpose of the Willamette Valley Project is to ameliorate this accentuated condition, especially in the Willamette River.

All the principal elements of the Willamette Valley Project are a coordinated water plan for control and use of the waters through stream flow regulation and storage of non-wasted run-off; a program for agriculture and agricultural land use, including soil conservation; a forest program; a program for development of minerals and mining; a program for industrial development and stimulation of market outlets; a program for preservation and improvement of recreation areas and facilities, and a program for community stabilization and social betterment according to its sponsors. Key to this from the standpoint of hydrography is building of seven dams to store thousands of acre feet of water.

Findings by the Corps of Engineers, United States Army, have provided the basis of a water plan. The reservoirs basic to their plan provide for flood protection which amounts primarily to regulation of run-off;

development of navigation facilities and maintenance of a nearly constant depth; development of 453,000 kilowatt hours of hydroelectric power; irrigation of over 300,000 acres; stream purification, and drainage of lower lands thus maintaining a more ideal level of ground water resources.¹

<u>Reservoir</u>	<u>Stream</u>	<u>Acre feet</u>
Cottage Grove	Coast Fork	30,000
Dorena	Row River	70,000
Lookout Point	Middle Fork	340,000
Fern Ridge	Long Tom	95,000
Quartz Creek	McKenzie	335,000
Sweet Home	South Santiam	310,000
Detroit	North Santiam	165,000

At the Fern Ridge and Cottage Grove Reservoirs the initial development has already reached an advanced stage. Preparations have been made for construction work at Dorena. However, the program has failed to attain an emergency status. As a result, work may come almost to a standstill through the remainder of the present crisis.

So far very little levee or revetment work has been done. Even those feeble, initial attempts have proven ineffective and gone out. Much good work of that nature should be done soon. The Willamette River is aggrading rapidly, thus making future flood dangers more serious through greater gradient of escaping waters. This work must become an integral part of the master plan for effective flood control in the Upper

¹ United States Army Engineers, Willamette Valley Project (Portland: United States Engineer Office, 1940).

Willamette Valley.

An immediate result would be increased productivity of the farm lands and a greater assurance of crops. Greater purchasing power would raise the living standard of quite a segment of rural population. That would represent a positive step in realizing the optimum from the land resource.

The whole discussion of ground water supply has assumed existence of a pattern of streams bringing water supplies to the valley region. However, up to this point peculiarities of stream patterns haven't been discussed sufficiently to give adequate correlated material to fully understand areal ground water occurrence.

To begin with it might be said that the Upper Willamette River is an excellent example of a "braided" stream. That in itself is geologic evidence that the stream has recently shifted in position. From the strike of the underlying rocks the river should be expected to run near the eastern valley wall. However, the Cascade tributaries are so much larger than those of the Coast Range Mountains that the river is pushed westward toward the smaller streams, and also those of lower gradient. From this it is evident that ground water occurrences aren't permanently located; nevertheless, from the standpoint of living man, such changes are of no great importance.

Larger streams like the Santiam and McKenzie Rivers are able to join the Willamette River nearly accordantly, but the small streams often have to assume the status of "Yazoo" streams paralleling the main stream for many miles before effecting a juncture. This condition exists

because in the upper part of the valley local base level has been attained. As a result, natural levees have been built making ease of union between a main stream and a tributary quite difficult. The figure which follows on page 14 illustrates the preceding discussion.

Hydrography of the Upper Willamette Valley

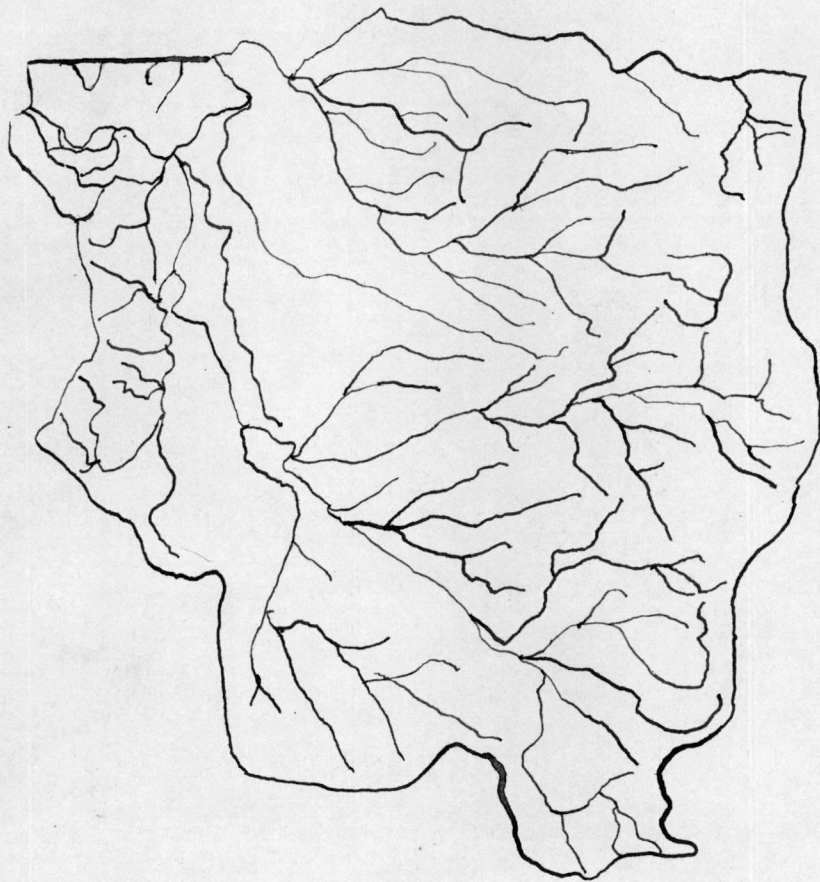


Figure 2

CHAPTER II

POPULATION

Spite of any conceptions to the contrary, population of the Upper Willamette Valley is predominantly rural. The ratio in 1940 was 74 : 44 as determined from Bureau of Census reports. Not only is that true, but rural population is increasing, and at a much faster rate than the national average. A rural increase of sixteen per cent was noted for 1930-1940. Urban population is increasing at an even faster rate. During the same period it grew by thirty-eight per cent. In both Linn and Lane Counties the number of urban population gained in percentage compared to the total rural population make-up.

Linn, Lane, and Benton Counties experienced greatest percentage gains in urban population respectively. Lane County experienced the greatest percentage gain in rural population. One of the prime reasons for Lane County's standing high in these population factors is opening of the Cascade line of the Southern Pacific Railway and coming of railroad shops to Eugene.

Not all of the rural population of the area are farmers. There is a large non-farm group living outside the urban districts. This body depends upon industries in those towns that happen to be nearby. Often it is a none too stable group, especially during periods of depression. No one available outlet for its energies provides sufficient income for a decent living at that time.

One of the principal reasons for population gain in this section is movement of people from other states, driven here out of economic necessity. The State Planning Board reported that from 1950 to 1957 this increase amounted to 14,088, more than half of whom came to Lane County. These people seemed to be predominately young and preponderantly male. They represented all walks of life and seemed to disrupt educational and social solidarity to no great extent. It is the transient population that constitutes more of a social and economic problem according to Oregon State Employment Offices.

Employment offices contend that migration into this area now is very slight compared to the peak reached during the middle thirties. However, transient laborers still come and go as has long been the case. Just this year a migratory labor camp was established at Coburg to place laborers in harvest fields and allow them to live in places not so closely associated with squalor so familiar to them. These people, though, aren't reckoned with in the population make-up because their residence is so fleeting. There is, however, that group of migrants which has come to make this its permanent home. It is an integral part of our population now.

The only group that causes much disruption among the newcomers is that group of unskilled laborers and sub-marginal farmers. They are problems in varying degrees just as is some of our indigenous population a problem. The State Employment Office breaks them down into a group that can stay with no job any length of time, a group of lumbermen and agricultural workers who are more valuable to the economy, and a group

composed of all gradations of farmers.

Many of the migrants, too, aren't found in rural areas. They are from urban areas of the East and as a consequence come to cities here to find something they can do. A cross-section of all our immigrants would, in fact, correspond to a cross-section of Oregonians in reference to job proficiency and educational attainment according to Social Security Board and State Employment Service records.

Concentrations of foreign groups are rather unimportant here. There is a slight Danish group at Junction City and another west of Eugene. Linn County has a small Czech group, while Benton County has some Russians. Most of the people are native-born Americans and are almost without exception white. This is a decidedly positive advantage in attaining social solidarity and reaching an "economic optimum" whereby the most productive ratio between people and natural resources is attained. Of course, that condition as yet is far from being realized as is exemplified by unwise use of soil, water, and climatic advantages.

There is one area of great concentration of population, and that is Eugene. In a radius of slightly over a dozen miles from the center of the city are 40,000 people. That constitutes about one-third of the people in the whole area. This causes Eugene to be the key or pivotal center for many activities and a barometer for the section. In many instances, a trend, or anticipated trend or change, in the area of heavy population will be indicative of a general condition. An example is an increased tendency for growing garden truck; the cannery at Corvallis largely meets the same sort of agricultural response.

During most of the depression period housing permits were few compared to what they have been of late. Some fine houses have been built during the last decade, though. There was, of course, a moderate amount of building of all types of houses. The tendency among many of them was a less sturdy house constructed from cheaper building materials as a response to lessened purchasing power.

In many instances the housing expansion showed a lack of planning. Many houses, for example, have been built in South Eugene and in the River Road district where floods are an ever present menace during the rainy season. This constitutes a hazard to health and property.

At Sweet Home and other areas in the valley periphery rather squalid dwellings have been erected during boom times. There is no social justification for them, and the economic justification upon which they rest is unsound from the standpoint of sound, long-time planning. This defeats the purpose of establishing the most productive ratio between people and natural resources.

Approximate Population Distribution

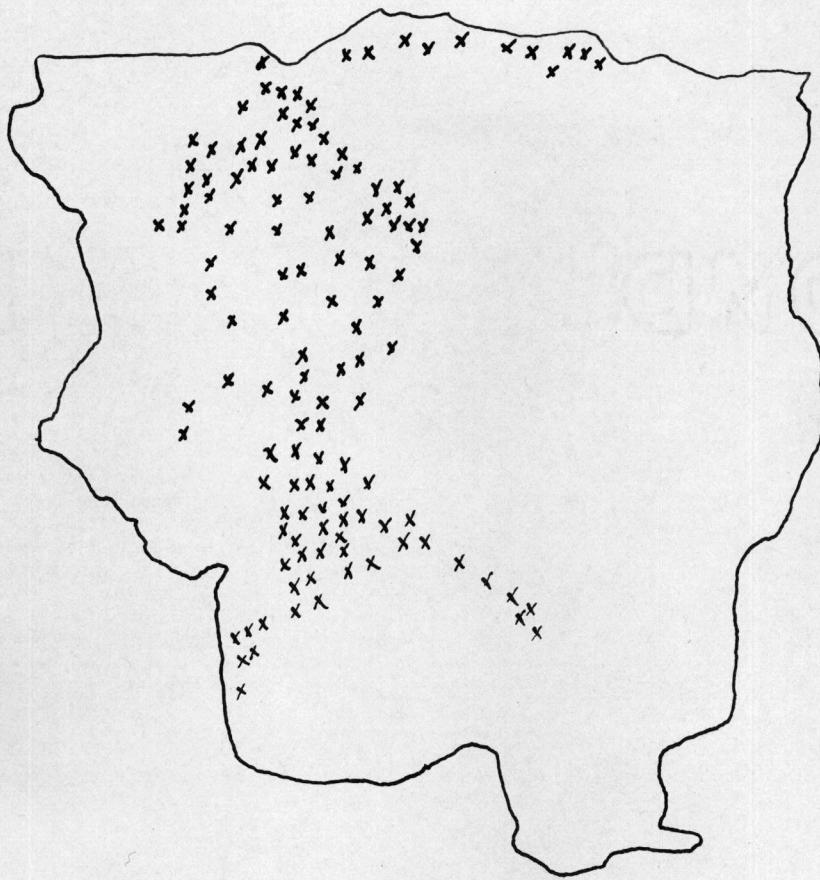


Figure 3

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GREEN, GEORGE

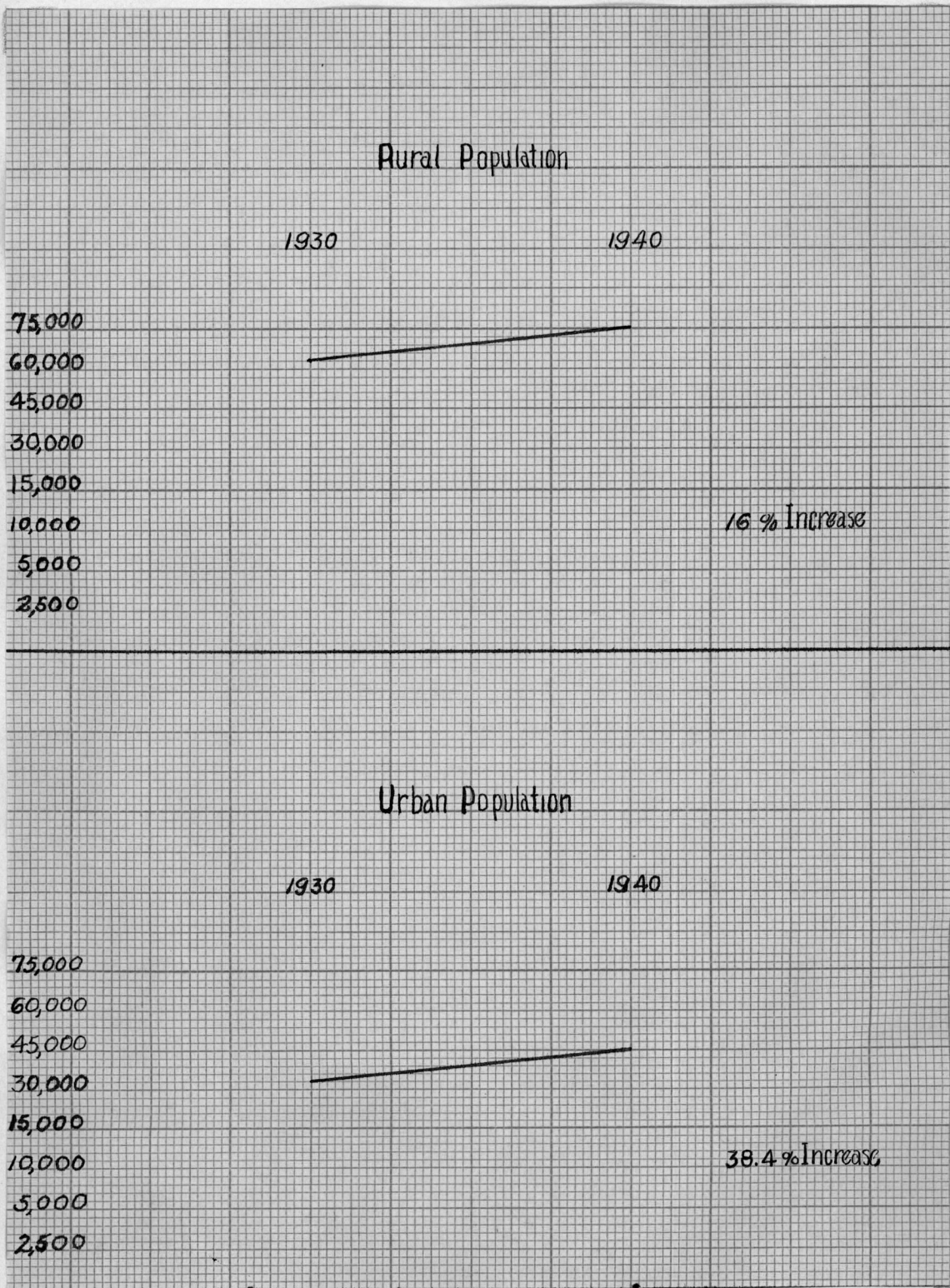


Figure 4

CHAPTER III

LAND USE, AGRICULTURAL

"It (the Willamette Valley) is essentially an area of relatively small farms, and recent tendencies indicate that further intensification of its agriculture is developing."¹ Intensification implies that there is no lateral expansion in area farmed. The additional farm population is supported on a greater number of farms within the region. According to census figures area in farms increased only two-tenths of one per cent in the last decade, thus substantiating the statement that lateral expansion is unimportant. That there are more farms in the region is substantiated by Bureau of Census figures showing an increase from 8,483 to 9,286 farms during the ten-year period, or a gain of nearly ten per cent.

The first conclusion to draw from an increased number of farms on a nearly stationary agricultural acreage is that farms have decreased in size. Bureau of Census figures bear this out, too. Every county shows a decrease in size of farms. The variation is from a four acre average diminution in Linn County to nearly twenty-three acres in Benton County.

¹ United States Department of Commerce, Commercial Survey of Pacific Northwest (Washington: United States Government Printing Office, 1932), p. 193.

Among the more important types of farms according to census records are general, part-time, dairy, poultry, and fruit in that respective order. The rank of importance is based upon number of farm units in each type. The classification would be more accurate if value of produce, value of investment, and acreage of each type were known. However, that would require a great amount of field investigation because few farms are strictly of one type.

Lane County appears to have the best balanced farm economy. It is engaged in all the more important types of farming to a moderate degree. A business depression in one crop line, or disaster to a specific crop, wouldn't come so near to shutting off agricultural purchasing power quite completely. Linn County puts the greatest emphasis upon general farming. Benton County holds the highest relative position in dairying.

Under pressure of agricultural intensification certain agencies and farms have paid close attention to soil composition and conservation. Such studies have been made with a view of obtaining the "economic optimum" from the agricultural lands. Among some of the findings are: (1) There is a deficiency of sulphur in basaltic soils of the valley; (2) Sulphur should be applied to basaltic soils if legumes are raised; (3) certain soils need applications of nitrogenous fertilizers; (4) Cropped and eroded soils show deficiencies of plant food and increases in acidity; (5) and that many soils respond favorably to applications of lime to

neutralize effects of acidity."¹

Certain positive reactions have taken place among the farming population as a response to soil studies. Of course, the most important is application of fertilizer. "The trend is toward use of fewer grades and more concentrated, completely available fertilizers."² The reason concentrated fertilizer is used is that transportation cost for all per ton is about equal; thus that which will realize greatest returns per unit of cost is utilized.

One of the things that has grown from soil surveys is a land adaptability pattern based upon chemical composition of the soils and specific requirements of various plants. The most ideal crop pattern then would coincide with prescribed practices of land adaptability studies. However, it is hard to determine whether or not such a correlation exists quite specifically. Consultations with the Farm Security Administration Office did bring forth some partial answers. It is their belief that in general the trend in crop patterns is correspondence with adaptability patterns. This is much more true now than it was several years ago. A favorable change has come through constructive work of county agents, through familiarization with soil surveys and experiment station work, Agricultural Adjustment Administration's payments for

¹Agricultural Experiment Station, Composition, Rating, and Conservation of Willamette Valley Soils (Station Bulletin 365, 1939).

²Agricultural Experiment Station, Twenty-two Years of Soil Fertility Investigations in the Willamette Valley, Oregon (Station Bulletin 387, 1941), p. 15.

better farming practices, and a more pressing need to get the utmost yield from the soil.

Inexactitude of correspondence of crop pattern and land adaptability is accounted for by the fact that on any one series of soils there are likely to be several types of crops growing quite satisfactorily. Also, there is a constant rotation of crops. Lastly, there is no sharp cleavage between soil series; thus transitional zones are created. Present recommended cropping practices haven't considered these areas. As a result of the previous statements one must be convinced that a crop pattern map would be difficult to make from what is observed in cropping practices. Finally, it would not convey full meaning when correlated with soil maps as they now appear.

To absorb the increased farming population it was recognized as early as 1937 by the State Planning Board that better farming conditions were necessary to prevent congestion. Soil analysis, fertilization, and conservation have already been mentioned as desirable factors in being able to realize the most possible from the farms. Among other desirable factors in that direction are irrigation and drainage. Progress has been fair in irrigation considering the handicaps under which individual farmers worked during the thirties. Acres irrigated increased from 1,300 to 5,000; but organization of drainage districts was almost at a standstill, according to W. L. Powers of Oregon State College. Had the drainage program gone ahead a great annual loss of crops on wet lands would have been averted. That would have put less strain on other resources in sustaining the additional rural population. In the future, though,

prospects appear brighter for promotion of better farming practices. That appears to be assured through inception of the Willamette Valley Project. However, the plan which has so far been authorized by Congress doesn't include construction of canals, laterals, or other fixtures necessary for irrigation, but the United States Army Engineers will cooperate with any districts as they become interested in utilization of storage supplies of water.

As an interesting sidelight it might be noted that farming is becoming increasingly mechanized notwithstanding a tendency toward smaller farms. In 1940 there were over three thousand tractors on the farms compared with about eleven hundred in 1930. This trend causes rural inhabitants to have more spare time than formerly; thus farming is less of a drudgery than before.

Farming intensification has seen many changes or trends in types of crops grown. Also, like phenomena are noticed in farm animal numbers. One of the outstanding examples is loss of importance formerly held by grain crops and the coming of specialty crops in which advantage is taken of peculiar characteristics of soil and climate. Filberts are one of the most important specialties among newcomers. In the animal realm the classic example is a great decrease in horse population and an increase in poultry.

The first picture to be presented is that of change in general farming. The three major crops under that classification in this area are over a period of years wheat, hay, and barley. For wheat the acreage has decreased almost twenty-seven per cent in the last ten years. This

can be accounted for by the fact that wheat is a large farm crop and would be antithetical to the farm size trend noted here. According to census reports hay acreage has decreased slightly, about eight per cent. This is because the number of farm animals has decreased. Barley acreage has increased a tremendous amount, mainly because it does not deplete soil rapidly and is a good dairy feed.

In the dairy industry a very desirable trend was noted. With an eleven per cent decrease in number of cows milked the total production was still higher than in 1930 by several per cent. That is certainly a decided indication that dairy cows and dairying methods are improving. From the fact that hay acreage did not decrease to the extent that cows decreased in numbers is a positive indication of better feeding practices on the dairies. That is a good farming practice, and one that will help solve a problem of increasing population and farming intensification.

Bureau of Census figures revealed that the number of horses decreased twenty per cent during the decade. That is a good indication that machines are fast displacing horses as a source of power on the farms. Especially, is this even more evident when it is also remembered that there has been an increase in agricultural units.

It is revealed that sheep have decreased numerically, also. The loss has been thirty-two per cent. However, there are still sufficient numbers of sheep to sustain large woolen mills in Eugene and Brownsville. The Eugene mill has gross annual sales of nearly one-third million dollars according to reports of the enterprise itself.

Poultry and turkeys have been among those to show increases;

poultry gained nearly twenty per cent, and turkeys gained twenty per cent numerically. Their gain is attributed to the fact that they lend themselves readily to intensified farming and part-time farms increasingly familiar to this area.

Fruit orchards, most nut trees, and vineyards have shown a decided loss in acreage, a loss of twenty-nine per cent. They have proved to be not so well adapted to peculiar soil and climatic characteristics of the Upper Willamette Valley as are garden truck, grass and hay seeds, and certain specialty crops. Of course, it must not be denied that market conditions had something to do with this trend.

Flax is one of the plants making gains during the last decade. Although the total acreage is now less than eight hundred, the percentage increase was great. Soil and climate of the region are quite ideal for flax fiber. Since the war has made European supplies inaccessible, the industry is receiving a decided impetus here. There are processing plants at Harrisburg, Springfield, and other places to care for the fiber.

Among the lands that constitute the greatest problem are those known as sub-marginal lands. They are stump ranches, undrained lands, eroded areas, and flood lands. There have been some adjustments in type of use and management taking place on them to make them economic farms. Among these are grass seedings which usually revert to ferns or brush, grazing until they revert to forests, and planting sod farming crops to assure permanent grazing land according to Dean Mason of the Oregon State College School of Forestry. Best adaptation seems to depend upon soil type, or location of the area in question with respect to population centers.

Adaptations on flood lands and undrained lands have been negligible.

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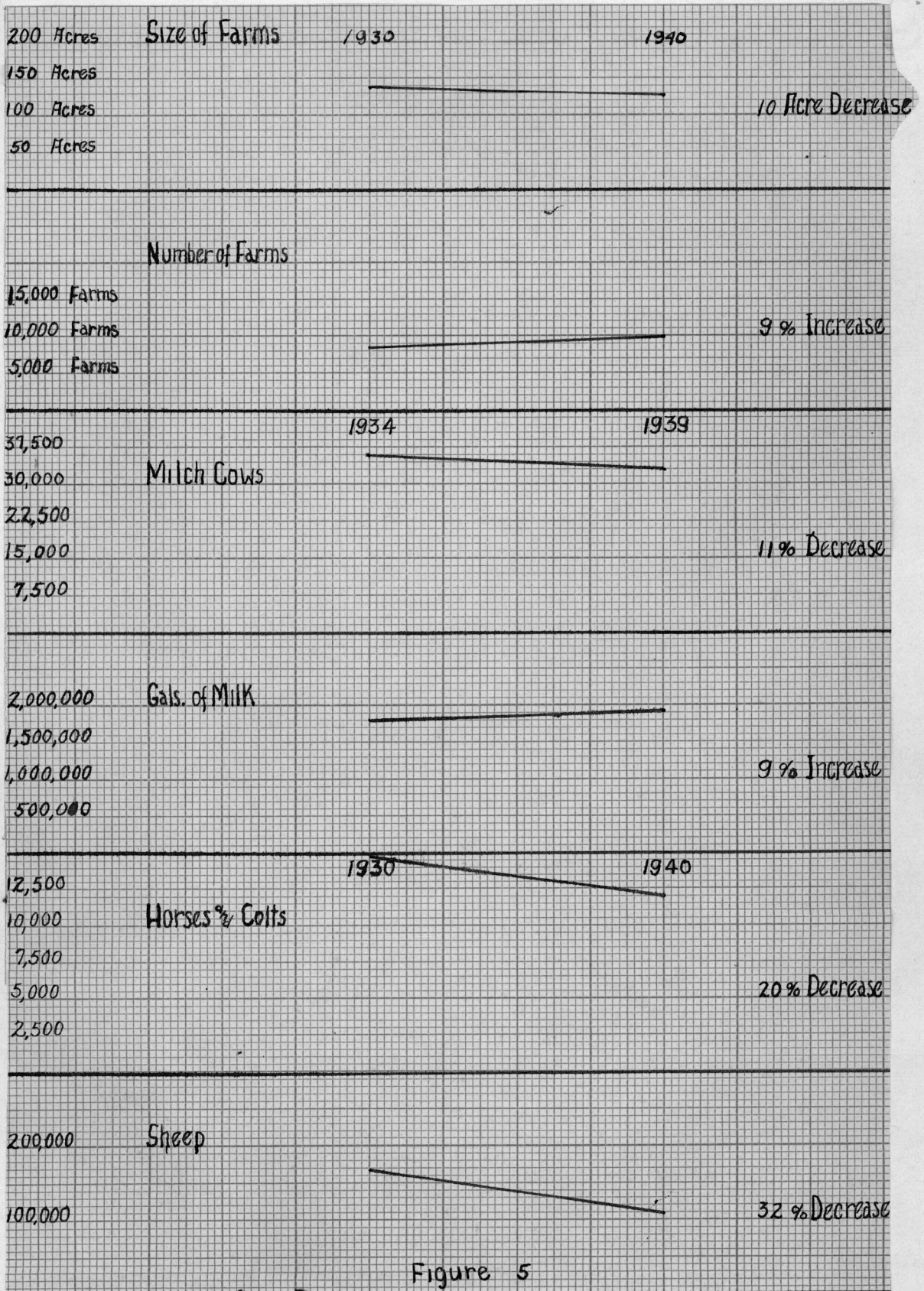


Figure 5

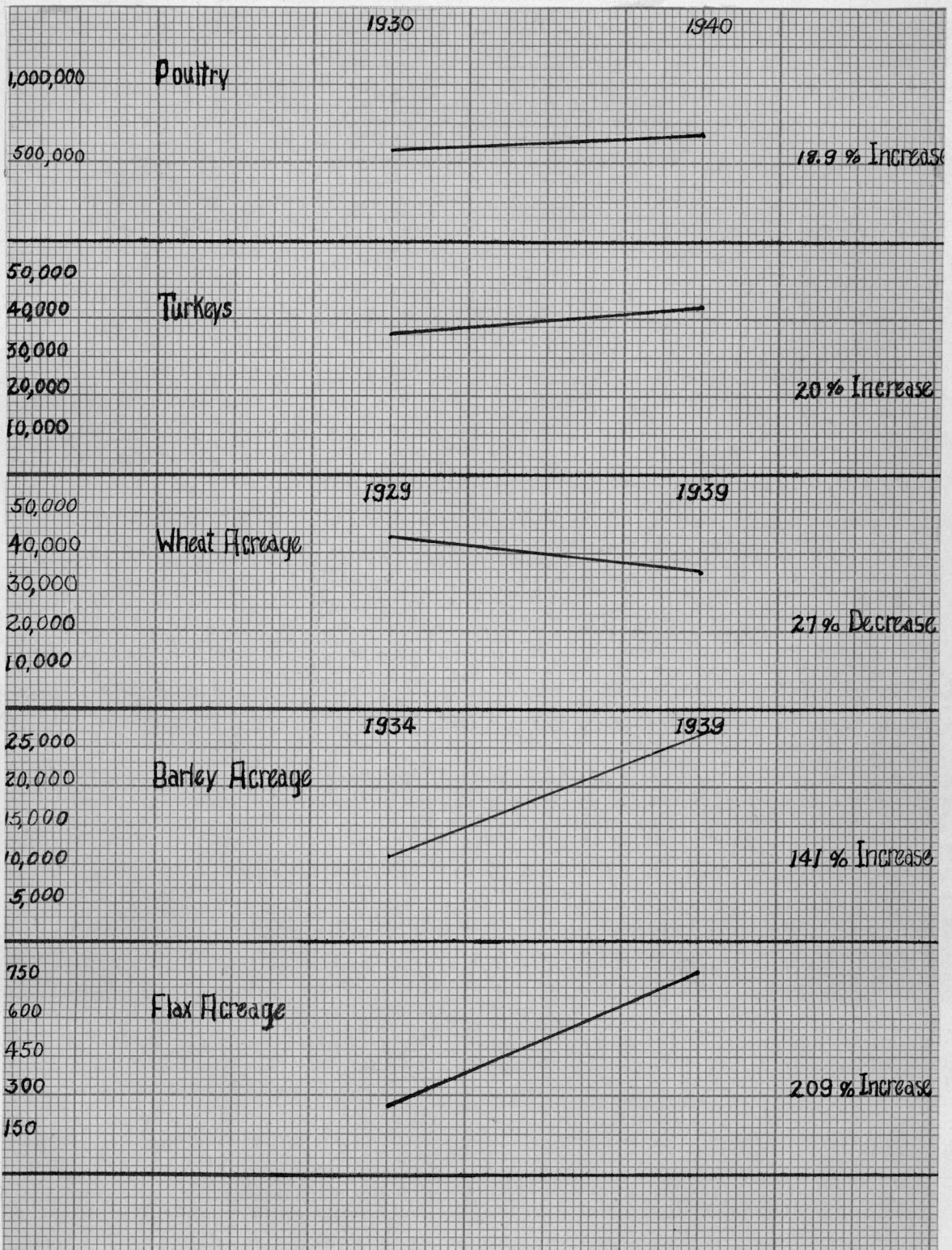


Fig. 5 (Cont.)

CHAPTER IV

LAND USE, FORESTRY

Any statement of the resources of this region can not neglect the timber resource. Here is one of the greatest timber stands in America, and it is composed largely of fine Douglas-fir. That the region is highly dependent upon its forests is made clear by the following quotation.

The highest service that the forests of the Douglas-fir region can render is in support and stabilization of communities dependent upon them. Included are, not only the people and investments in forest industries, but also those in farms, stores, banks, garages, schools, transportation, and various industries. Forests in one way or another support about half the population of the region. To redeem this enormous responsibility for service, forests must furnish a permanent annual harvest of material equal at least to present production. This will require a sustained-yield forest practice, including acceptance of the responsibilities of permanent ownership.

The major problem therefore is to bring about promptly the adoption of a system of managing old-growth and second-growth forests for the continuous production of high-quality material while there is yet sufficient growing stock to do so,¹ without calamitous dislocation of people and industry.

A study of the degree to which forest management policy is endeavoring to redeem this great responsibility for service shows that the effort

¹Andrews, H. J. and Cowlin, R. W., Forest Resources of the Douglas-Fir Region (Washington: United States Department of Agriculture, United States Government Printing Office, 1940), p. 1.

has not been very spirited. The plan whereby this effort is being enacted is known as sustained-yield. Primarily it is a policy which assures replacement of forests or maintenance of supply and prevention of horizontal retreat. Deeper than that the policy has many purposes behind it. Among them are conservation of the soil, retention of usual run-off, etc.

Sustained-yield has been almost entirely neglected on private lands except for fire protection. Poor logging methods have put the plan even farther in reverse. There has also been a marked tendency for operators to let land become tax delinquent when the forests have been "mined"; thus, there was no tendency for trees to be replaced on those lands where the former owner was no longer interested. During the last legislature a law was passed compelling private operators to operate on a sustained-yield plan. Little heed has been given it as yet because it has been ineffectively enforced.

Forests under governmental control, in contrast, are managed with due regard to multiple functions. These functions are sustenance of wild life, recreation facilities, maintenance of an adequate lumber supply, and checking run-off according to Forest Service officials. As the governmental development becomes more complete the most desirable practices will be realized with the most economic use of forests following as a consequence. The regional forest economists believe this well within the realm of possibility for more and more forests in the future. This is true because they foresee more acreage under government control and less under private ownership. As a consequence individual eccentricities

in time to come will have a diminished ability to hold the area on the brink of ruinous dislocation of population and industrial enterprise.

From the standpoint of most economic conservation practices one among other things to be considered is the extent to which growth can be increased through improved forest practice. According to Forest Service investigations all forests in the region can be put on a sustained-yield basis in about fifty years. With wise execution of this program for increasing yield a great amount of saw-timber may be safely cut now, especially should some of it be cut before it is too ripe. Without execution of a program to augment yield heavy cutting will result in ruin for the forest industry.

The amounts of timber that can be profitably logged and amounts that it is economic to log are two different things. It has already been noted what determines an economic operation. A profitable operation has a close correspondence with behavior of the business cycle. Among factors to be considered are proximity of the stand to transportation or market facilities, topography of the timbered area, density of the stand, size and quality of the trees, and species. When prices for timber are high, adverse combinations of these factors can be surmounted, still leaving a profit for the operator. During periods of business depression greater and greater areas assume a status of a sub-marginal operating area; thus, the area of logging becomes quite small.

Lumber production has increased tremendously in the area during the past few years. From 1934 to 1940 the annual cut increased from 340,900,000 board feet to 874,640,000 board feet according to the regional

forest office. On the face of it that might appear to be prosperity, but based upon the facts, it is something else. It is temporary gain for accelerated ruination. As has been noted previously little has been done yet to assure sustained-yields. That, in itself, is enough argument to reject this prosperity attributed to plywood plants, etc.

There is one bright side to the latest development. That is increasing diversity of output, which is recognized as economically sound; but even this is exemplified by those five plywood plants in Eugene, Springfield, Albany, Lebanon, and Sweet Home. The Upper Willamette Valley sadly lacks vertical integration in its forest industry. By that is meant the same concern does not perform all the processes of manufacture and distribution. It is distinctly a region of small sawmills and small woods operators compared with Puget Sound and Columbia River areas.

Interaction of these negative factors tends to make production costs high through excessive duplication of processes. Only when unusual conditions of timber stand, topography, etc. operate can operators here easily compete with Columbia River and Puget Sound enterprises, say forest economists. That gives rise to an ever more serious, immediate sustained yield program in those favorably located forests of the region, or soon it will be hardly possible to compete with other more ideal timber resources of the Pacific Northwest, assuming both follow identical timber policies.

Approximate Location of Sawmills

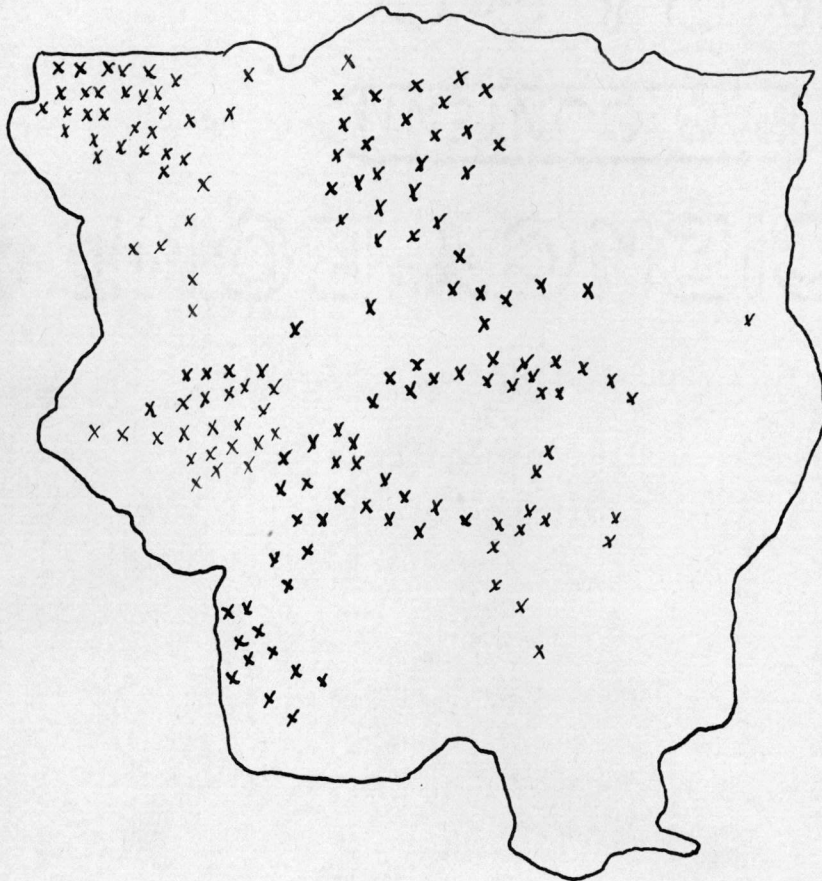


Figure 6

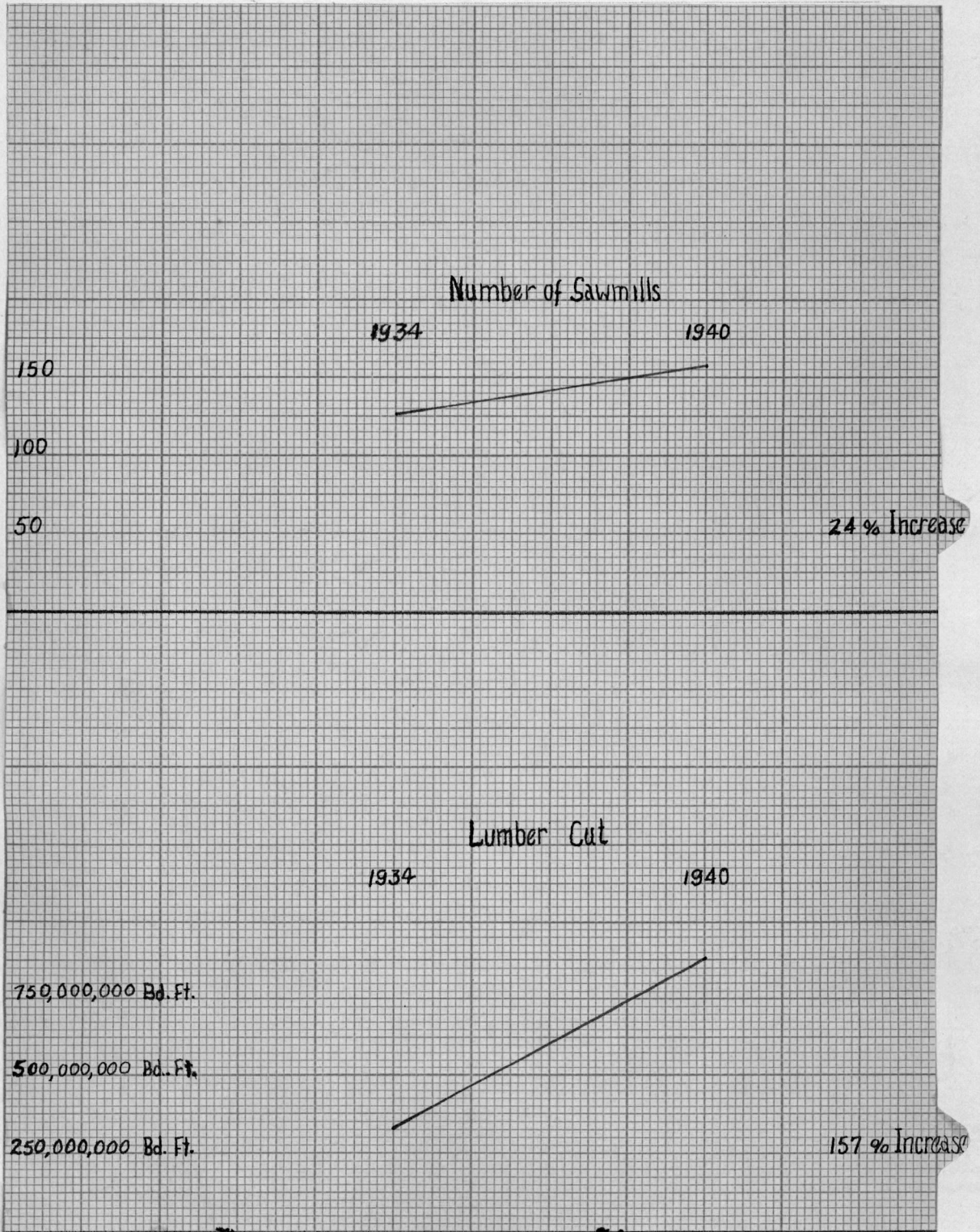


Figure 7

CHAPTER V

INDUSTRY

Manufacturing here consists largely of converting forest and farm products into finished goods. There are a few miscellaneous developments, of course, like woolen mills, linen mills, beverage manufacture, clay and tile works, and foundries. In comparison, however, they are dwarfed by activity in the two major phases.

First industrial development in the lumber industry will be approached to detect nature of changes or trends there. According to the regional forester's office the number of mill operations increased from one hundred twenty-four to one hundred fifty-six. At the same time cut has been doubled. This indicates that the operating unit is becoming larger, or mills formerly were not operating at capacity. The case seems to be larger mills. That can be recognized as a desirable trend as production costs are lowered through diminution of duplication of processes, and vertical integration is more easily obtained through that type of organization.

The greatest part of the industrial payroll of the region goes to workers in those industries connected with forests. In Lane County it amounts to seventy-five per cent of the total. Also, it is especially high in Linn County since building of its three plywood plants.

The railway system here is in part a response to the lumber and timber products industry. A large majority of rail tonnage is forest

products, sometimes as high as three-fourths of the tonnage. When the lumber industry is not prospering, railroads are severely affected from need of available freight. At the present activity in the lumber business, war movements, etc. are keeping the railroads busy. Even the formerly almost idle electric railway from Eugene to Portland is running steadily again.

Manufacturing of agricultural produce consists of several little industries. Some of them are canning fruits and vegetables, processing dairy products, and packing meats. Right away it is evident that little change has taken place in meat packing, except a downward trend in the number of heavy animals available from the aforementioned decrease in sheep and cattle. In the other two phases there have been interesting changes.

Creamery and dairy officials point out that there have been only small extensions in creamery plants, but some extensions in condenseries and cheese-making facilities. The immediate trend is diversion of milk from butter to cheese, condensed milk, and dried milk. This is being done to facilitate shipment to an enlarged English market, and to get it to them in a variety of forms to make its consumption more inviting. A result of this trend to be felt here is that butter-making machinery will not run at capacity. At the same time investments must be made in other machines, thus raising the cost of manufacture of the product.

One of the greatest manufacturing industries, aside from that connected with the timber resource, is canning fruits and vegetables. Many thousands of tons of farm produce are handled by the canneries each year,

and according to managers' reports the tonnage is increasing rapidly. Of this vast amount of produce there is a trend whereby increasingly larger percentages of vegetables are canned. Fruit has lost its former position of importance. These trends are a response to the new and smaller type of farm unit where intensive farming must be resorted to, to make the operation profitable. Also, as mentioned before, it is a response to special soil and climatic characteristics more suitable for vegetables than fruits.

One of the classic examples of a fruit being displaced by other crops is the case of the prune. Its decrease has bordered upon exclusion. As late as 1935 prune tonnage was second highest of all cannery goods. Now, nearly twenty products exceed the tonnage of this fruit, and that is generally true in canneries at Eugene, Corvallis, and Lebanon.

Among those vegetables that have assumed a role of importance are spinach, rhubarb, squash, beets, carrots, celery, and corn. About the only fruit maintaining a favorable tonnage record is pears. Of the berries, youngberries and boysenberries are the ones figuring increasingly high in quantity.

Telephone usage to a great extent, and increased demands upon water supplies, are often recognized as indicators of industrial activity. Both of these services have experienced increased demands. Increased water usage is exemplified by completion in 1940 of a new reservoir to serve Eugene. In 1930 the key cities in the area showed a total of 11,654 telephones; this included the adjacent rural regions. Figures for October, 1941 indicated 14,518 in the same area. This is attributed

to activity in agriculture and lumbering, and a general increase in most lines of business endeavor.

It is hard to determine accurately any trends in rural installations of telephones. Cities often have fixed their boundaries several miles into the rural areas; then boundaries would be altered in respect to distance from the city. Even though installation statistics mean little without knowledge of boundary changes, it can be safely assumed that rural telephone usage has increased considerably. This has brought about a better coordination of rural and urban business inter-relationships.

CHAPTER VI

TRANSPORTATION

Topographical features here are favorable for road and railroad building. There are adequate foundations for road beds and few natural obstacles entailing expensive detours or blasting. However, road patterns still have a surprising tendency to follow stream patterns, but on high enough ground to have a degree of freedom from the flood menace. Other factors affecting location of roads in this region are consideration for serving the greatest number of people, and presence of recreational areas and facilities. In the Upper Willamette Valley it is clear that heaviest population concentrations are along the streams as was shown on the population distribution map in Chapter II; thus those roads are desirably located from the standpoint of serving an optimum number of people.

Some of the new highway developments are completion of the Willamette Highway over the Cascade Mountains, a road to Mary's Peak near Corvallis as a recreational development, a highway from Junction City to Eugene, an improved road over the South Santiam Pass, and certain improvements at Albany and Eugene to eliminate "bottlenecks" in traffic.

Figures furnished by Secretary of State, Earl Snell, show that highways are handling an increasing share of goods formerly carried by rail roads. In 1930 Linn, Lane, and Benton Counties had 2,016 trucks licensed. Ten years later the number had risen to 4,010. While quite a quantity of

these trucks are being used on farms, a good many are being used by logging operators. The last mentioned usage results in railroads losing tonnage where their interests are greatest of all. This trend has given the logging operator greater independence in his enterprise than previously.

Airways are assuming an increasing importance here as elsewhere in the transportation picture. By 1930 infant air developments had already made their appearance. These were at Cottage Grove, Springfield, Eugene, Albany, etc. Springfield's airport is the site of mill operations now. Cottage Grove's airport, too, is only an emergency landing field. Principal scenes of a progressive program at present are Eugene and Corvallis. A super-airport is being constructed a few miles northwest of Eugene. At Corvallis negotiations are reaching the stage of completion for building a large air-field south of that city.

The Route F development which proposes to have an improved road from Eugene to Swiss Home will shorten the distance to coastal areas by several miles. From that standpoint it will be of value to vacationists in decreasing travel expense. Also, it will traverse a very scenic region along the Siuslaw River, exposing that wealth of recreational resources and facilities heretofore concealed from pleasure seekers.

In contrast to recreational advantages offered by the Route F program there are other aspects whose nature is not economic. According to highway engineers and regional planners a road should tap an area of sufficient population to compensate for its construction through resulting business diversion; it should avoid sub-marginal areas; or the road should

be able to serve as a stimulus to development of the region in the future through utilization of abundant resources. Route F could not sufficiently meet any of these essential requirements. In time of war, however, it could be warranted as being of strategic worth in that it would make troop movements more facile.

A conception that Florence should have port facilities developed to serve as an outlet for this region does not have its formulation based upon the facts. Already a quite adequate transportation system has been set up for the Willamette Valley. The whole system, including arteries, is based upon a north-south movement of goods. That has been the natural result of the usual response wherein transportation developments respond to the topography of a region, following the easy routes. Also, it is unnatural to divert a transportation system through an area almost devoid of population. The remaining trade that would migrate to Florence through operation of laws of natural advantage would hardly warrant expenditure for shipping facilities.

CHAPTER VII

ELECTRIFICATION

There is an increasing amount of electricity being used in this area. Source of the new, additional supply is an extension of Bonneville power and enlargement of some local plants. Previously the only supplement to local power developments was Mountain States power.

For transmission of Bonneville power nearly four hundred miles of line have already been strung according to figures furnished by Bonneville Power Administration. More than that, much additional line has been proposed.

The majority of new installation of electricity is in rural areas where it is distributed by agencies set up locally since Bonneville, the chief distributor into new territories, retails no power directly. However, there are still many communities not yet adequately served. Especially is this true in Lane County where the new development arrived last.

Cheap power rates and lenient terms to pay for the installations have invited several new uses for electricity differing materially from usual urban utilization. Among some important rural uses are pumping water for irrigation, running milking machines on many of the larger and better dairies, and a limited use in sawmills. The latter use has not proved wholly satisfactory as yet, but on the whole, electrification has made farming easier and leisure hours longer.

The cash value of electric companies for Benton County was \$860,060; for Linn County \$1,894,630; and for Lane County \$1,696,509, in 1940 according to the Tax Commission. The amount invested in Lane County has increased materially since then through completion of a \$500,000 steam plant which will add as high as 10,000 kilowatts to the available power supplies in this area according to Mr. Northrup of the Eugene Water Board. This development came as a direct response to an increased demand for power which rose from 2,376 kilowatt hours per residential customer per year, to 2,700 per year in Eugene from 1939 to 1941.

From the standpoint of deriving optimum benefit from electric power it should be distributed in such a way that the greatest possible number of people will derive good from it. If a preponderance of power is diverted to a few heavy users per employee, fewer people will receive direct employment in industry; thus, the main purpose of a program for wise distribution is defeated. Also, that would assure only a small gross population increase which in a relatively undeveloped region is undesirable. If the situation be true wherein outlets for power are varied, many people are assured direct employment with its resulting advantages of increased purchasing power and higher standards of living.

Now to see if this region is using its power most wisely in view of criteria just alluded to. The Bureau of Census reports that the following industries are heavy users of electricity: plywood plants, ice cream plants, and those manufacturing ice. Their rankings are three, twelve, and twenty from a total of over three hundred industries. All three of them are important in this region, especially the first. This, in part,

accounts for the augmented use of electricity. Present cheap rates and forthcoming cheap power rates from Bonneville assure coming of other industries consuming great amounts of electricity. That tendency must be guarded against with utmost care. Bonneville, to a certain extent, has already seen the importance of the problem in giving citizen groups and government bodies preference over profit organizations in dissemination of its power.

CHAPTER VIII

RECREATION

Among some of the findings by the State Planning Board and the State Parks Commission in reference to recreational areas and developments are the following: (1) The vastness, variety, and quality of the resources is almost unbelievable; (2) Mild and equable climate of the region encourages long vacations and some type of recreational activity during every month of the year; (3) The Federal Government has the most extensive holdings of existing recreational facilities; (4) Many sites have been developed by the Forest Service for camping and picnicking where under special permits many resorts, hotels, and summer homes have been established in recreational areas; (5) There are many commercial camps and resorts; (6) And winter playground areas have been developed. An example of the latter finding are skiing facilities in the McKenzie River and Three Sisters areas.

As was previously mentioned most of the recreational improvements are of federal nature. According to the Department of Interior, National Park Service, Lane County and Linn are the only ones in the area having any state parks. They have twelve, but some are quite distant from the valley region and poorly supplied with recreational features. These parks constitute about 1,200 acres. The capacity of any one of them is small as yet; however, the largest can now accommodate about two hundred

people at one time. Adequate attendance figures are not available to ascertain whether or not they are being utilized to their full capacities. It appears that the parks have not been publicized or made attractive enough to warrant optimum attendance, but an ever increasing number is taking advantage of parks as roads and park facilities are being improved.

State and federal parks are supplemented by county parks. All three counties now have the latter development.

The State Parks Commission reports that the most recent state park acquisitions are Armitage State Park near Coburg, and Cascadia State Park in Linn County. Cascadia Park includes Cascadia Mineral Springs. Both these parks are located near population centers and will offer recreational advantages when properly developed for those inhabitants so fortunately located.

That recreational developments are being increasingly used is verified by the State Parks Commission report of 1938. At that time it was reported that tourist travel was rapidly increasing. Better economic conditions throughout the nation accounted for some of the augmentation, but most of it can be attributed to development of highways and other recreational facilities. One example of this is the new highway across the Willamette Pass. It has given access to the bounteous recreational resources of the upper reaches of the Willamette River.

One of the phases of the Willamette Valley Project will facilitate recreational development. That phase is abetting stream pollution. Cleaner streams will result in maintenance of greater numbers of fish through assurance of more plant foods in the water. More and more people

come to this area as the fishing streams are becoming better known. Of course, local residents always enjoy fishing, and this sport should be perpetuated for their benefit, if for no other reason.

Another type of development that might be mentioned is the game refuge. In this area there is a vast region in Linn County devoted to the protection and perpetuation of bird life among the game species. During the past several years, quite positive results have been achieved in respect to increasing numbers of pheasants, especially.

CHAPTER IX

CONCLUSION

Important Findings

1. Soils are of varying chemical constituents necessitating a variety of crops and cropping procedures to get optimum production.
2. Population concentration in rural areas corresponds positively with better soils because of better crops.
3. Little promise exists of great ore deposits because of extended cover of deep andesitic lavas.
4. Summer rainfall is deficient by about fifteen inches.
5. Three-fourths of the area is forest covered.
6. There is an abundant supply of ground water in certain soils making possible a great amount of supplemental irrigation.
7. Artificial storage supplies are planned to provide irrigation for nearly one-third million acres.
8. The population is predominately rural and is still increasing.
9. Greatest population gain is from others coming to areas rather than to a natural increase.
10. Migration is very slack at the present.
11. Farming is assuming a status of intensification.
12. Very little new area is being farmed; thus farms are decreasing in size in view of increased rural population.

13. Fertilization and conservation of soil is increasingly practiced.
14. Land adaptability and crop patterns can not be said to correspond as exactly as desirable.
15. Drainage developments have been at a standstill while irrigation has continued to advance.
16. Farming is becoming more of a mechanized enterprise.
17. Certain crops have lost a position of dominance in production figures while some relatively unknown ones have supplanted them.
18. Sustained-yield has achieved positive results where an effort has been made to put it into effect.
19. Privately owned forests constitute the greatest forestry management problem.
20. Lumber production has increased tremendously of late.
21. There is an increasing diversity of lumber output.
22. Vertical integration is sadly lacking in the forestry industry.
23. Manufacturing is closely related to eccentricities of farm and forestry industries.
24. Manufacturing units are becoming larger in an area of characteristically small operators.
25. Roads have a decided tendency to follow stream patterns.
26. Trucks are assuming a greater importance in the transportation picture.
27. Route F and Florence seaport facilities do not appear to be economically justifiable.
28. More electricity is being used, and the rural areas are using a

great deal of this increase.

29. Rates for electricity are low.
30. Federal bodies are supplying a great amount of the additional supply of electricity.
31. There is a tendency to divert electricity to industries known to be heavy users per employee; the tendency is undesirable.
32. Park facilities are being expanded and improved.
33. From inadequate records it is believed that more people are taking advantage of recreational developments.

With these factors in mind it is more easily possible, after critical evaluation of them to proceed to a condition of maturity from the standpoint of human and economic geography. Without preliminary evaluation of this sort any plan to evolve into a state of maturity must be thrown into discard. Such a program must be based upon an adequate foundation obtainable only in this way.

From the foregoing it has been noted that the Upper Willamette Valley is well endowed with those factors favoring sound growth in the future. Among some of those factors, it might be reiterated are: favorable physical conditions, inland waterway, natural trade routes, abundant resources in water and land, and an ambitious population. The desirable hope is that interested people will see that these factors tend to interest ever more favorably.

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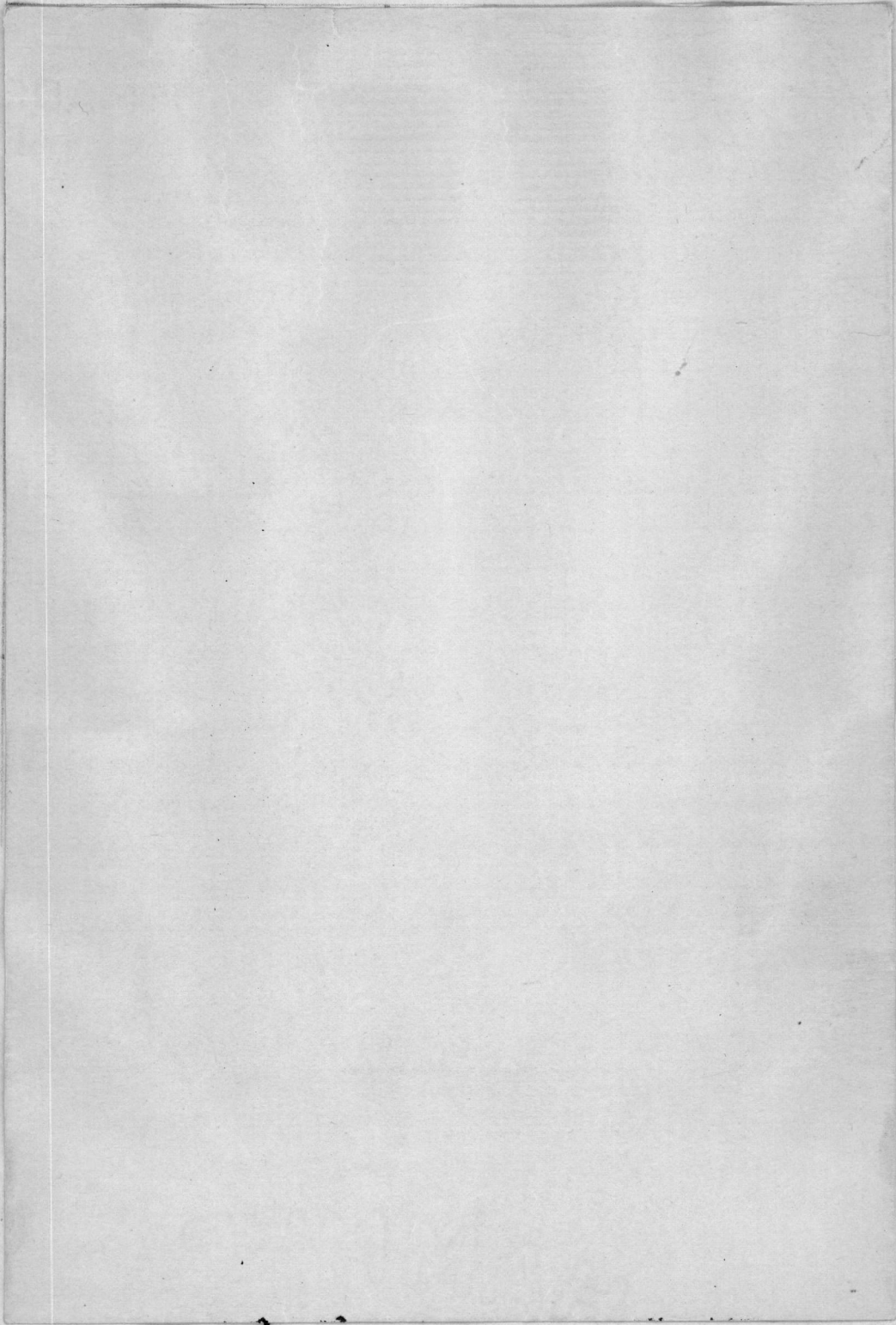


Figure 8

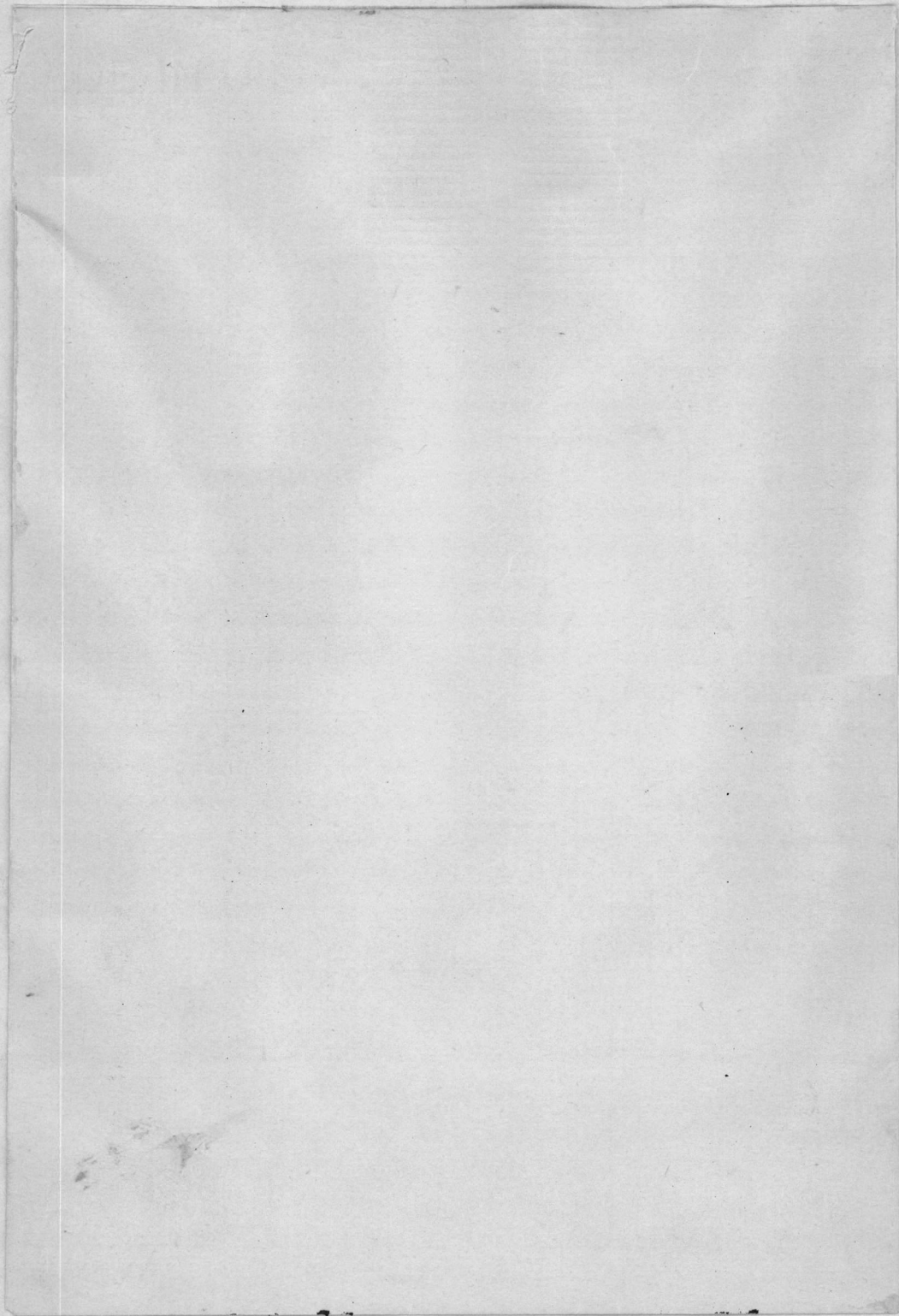


Figure 9

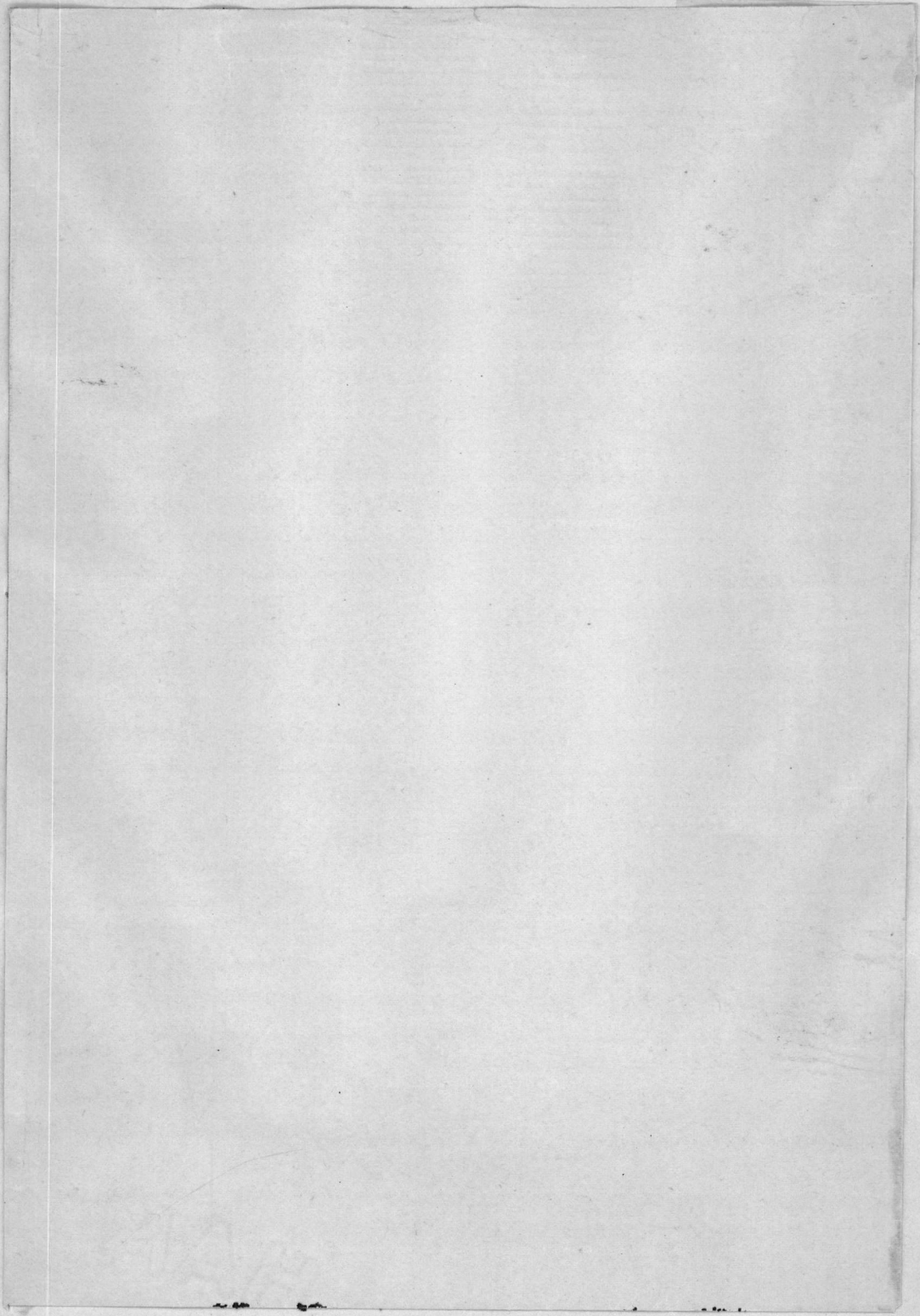


Figure 10

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