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GEOGRAPHIC INTERPRETATION OF LAND USE

IN

LORAIN COUNTY, OHIO

By

George M. Howe

B.S., California Institute of Technology, 1945

A thesis submitted to the Faculty of Oberlin College
in partial fulfillment of the requirements
for the Degree of Master of Arts
in the Department of Geology
and Geography

1948

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PREFACE

Geographic study aims at systematic description and interpretation of the interrelationship of organic and inorganic things on the face of the earth. The geographer analyzes land use patterns in the attempt to understand the intimate relationship existing between man and the geographic environment. The number of people that a given amount of land will support, and hence the manner in which this population uses that land, is a function of the resources of the area and the culture of the men making up the population. Basically, resources of the land are its geographic elements of soil, climate, physiography, and vegetation; by culture is implied the economic, political, and social institutions by which men govern their activities. The land use patterns resulting from the alteration of the natural environment by men, conditioned by these geographic and cultural influences, constitute part of cultural geography.

Constant effort is made toward more and more detailed description and interpretation of the landscape, which involves decreasing the size of the unit studied. The characteristics of Lorain County land use have been described briefly when use regions of North America or of the state of Ohio have been analyzed. In this thesis, Lorain County is the unit of study, subdivisions being

made within the county limits.

The general land use characteristics of Lorain County are typical of most of the counties of northern Ohio which border on Lake Erie. In this respect the dominance of the influence of geographic factors is clear, for in many ways these factors are similar in the lake-border region. Cultural influences account for the minor variations.

To accomplish a detailed graphic description of Lorain County land use (the accompanying Plates) it was necessary to construct the maps from interpretation of aerial photographs. A somewhat more detailed analysis could have been made if the uses could have been mapped in the field, but the area to be covered was much too large for such procedures.

The writer is indebted to Dr. R. B. Frost for suggestion and discussion of the thesis subject and to Dr. Irene Moke for many valuable suggestions concerning the preparation of maps and for helpful criticism of the textual material. Appreciation is extended to Mr. R. J. Eglin of the Lorain County Agricultural Conservation Program for much information and aid in interpretation of aerial photographs which made this land use study possible.

G. M. H.

INTRODUCTION

One hundred and forty years ago, what is today Lorain County, Ohio, was but a forest-covered expanse, dotted occasionally by grassland and swamp, traversed by clear-flowing streams. Now, after nearly a century and a half of occupance by white men, the forests are gone, the land is in urban use, plowed up or pastured, and criss-crossed by a dense network of highways, farm roads, and railroads. How different a landscape becomes as man, through the years, adapts his environment to his necessities and whims. Molded in land use development by "inherent, or inevitable"¹ geographic influences of climate, topography, soil, and rock structure and minerals, by "extraneous, or influences due to geographic position"², and by the culture of the settlers and later inhabitants, the present landscape of Lorain County retains little, if any, of its virgin appearance.

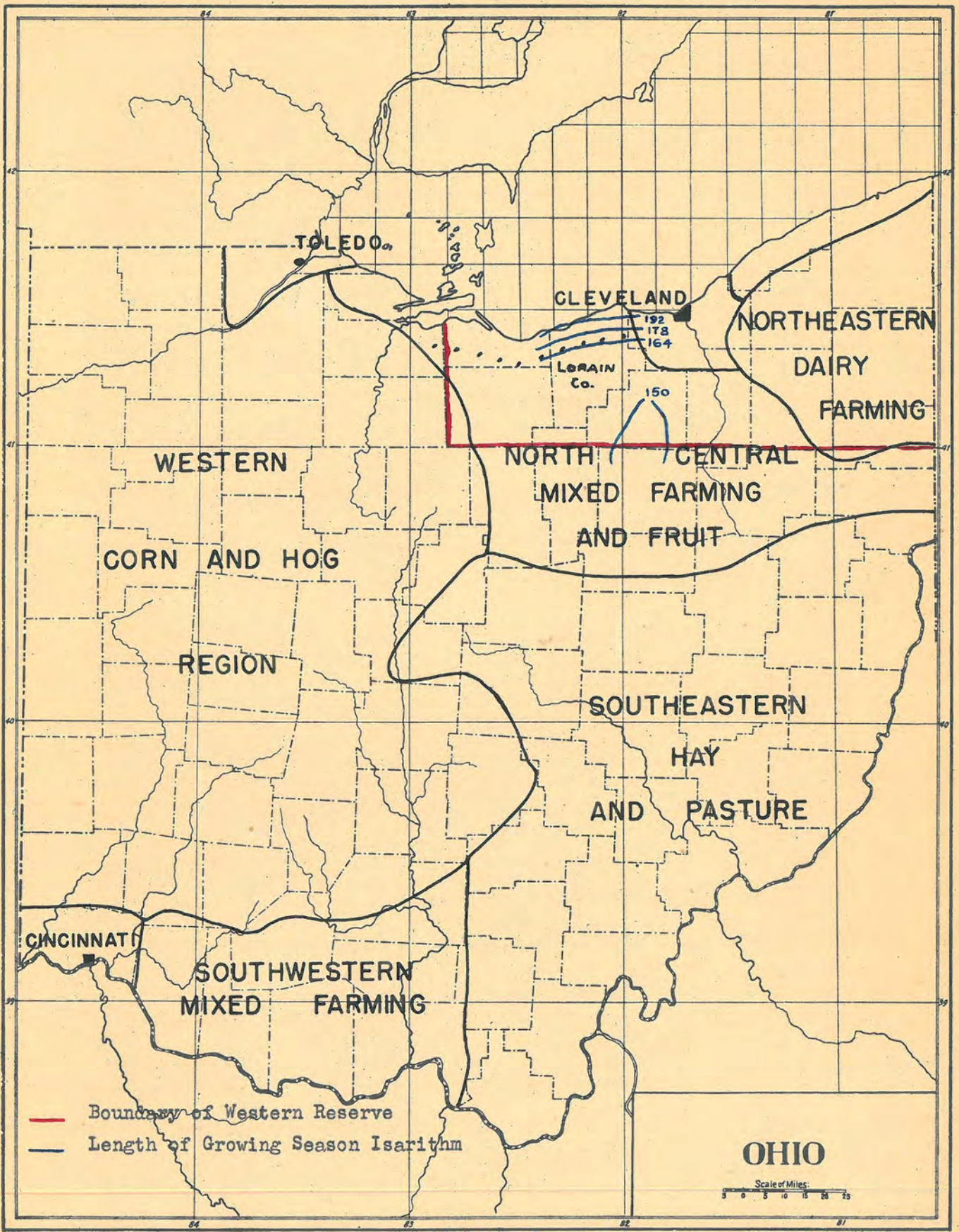
Lorain County is in many respects typical of the northern tier of counties in Ohio, those that border on Lake Erie; in some respects it is unique. The general land use pattern of a Fruit Belt close to the lake, intensive vegetable farming near the cities, and a Dairying-General Farming zone south of the Fruit Belt is similar in all of the

¹ Frank Carney, "Geographical Influences in the Development of Ohio", Reprinted from The Journal of Geography, Vol. IX, March 1911, p. 169.

² Ibid.

lake counties (See Fig. 1). The climate of the county receives the same tempering influence of the lake and the glacial topography and soils are not unlike those of other lake counties. Soils, although varying greatly locally, are all part of the Gray-brown Podzolic soil group. Physiographically, Lorain differs slightly from its neighbors for within the boundaries of this county three regions meet, the Lake Plains and Till Plains of the Interior Lowlands Province (Fenneman) and the Glaciated Plateau section of the Appalachian Plateau Province (Fenneman). Most other counties in this lake zone have only two of the three regions. The cultural background of most of the early settlers of northern Ohio differed little, perhaps because the majority, of New England stock, entered the region by the same route, the Hudson-Mohawk valley. There were early political ties with the Northeast, for the land claimed as the Connecticut Western Reserve extended across northern Ohio north of 41° N as far west as the present western boundaries of Huron and Erie Counties. Markets for products, another factor influencing land use development, were located on the northern Atlantic Seaboard, in the days of early settlement, and the same route which the settlers followed into northern Ohio was used in transporting their products to these markets.

Land use is conditioned to some extent by inherent and extraneous geographic influences, -- the basic or



JOHNSTON SERIES OF DESK MAPS No. D134 OHIO COPYRIGHT 1914. A. J. NYSTROM & CO., CHICAGO.

Fig. 1. Land Use Regions of Ohio, Growing Season of Lorain County, and Outline of the Western Reserve.

natural elements which in Lorain County have changed little since 1807 when the first permanent settlement by white men was established at the mouth of the Black River, the present site of the city of Lorain. But the changing patterns in the evolution of the landscape reflect the impact of scientific advancements, and of political, social, and economic factors on the original or traditional culture. Therefore a discussion of the land use of Lorain County, although based on natural factors, would show cause and effect inadequately without a consideration of historical development.

Land use of Lorain County may be classified in several different ways depending upon the size of the area analyzed and the detail of the analysis. Considered in the light of a regional study of North America, Lorain County falls within the "Lower Lakes Region"³, primarily an industrial region capitalizing on the facility of lake transportation for bringing iron ore from the great deposits of the northern Great Lakes to the vicinity of the coal deposits of the Appalachian fields. Only cursory attention is paid to the agricultural development. In a regional study of the agriculture of North America, Lorain County

³ J. Russell Smith and M. Ogden Phillips, Geography of North America, Harcourt, Brace, New York, 1942.

lies in "The Hay and Dairying Region"⁴. Here the agricultural development of a large area is described, but the peculiarities of single counties are not discussed. More detailed description is found when the area of study is smaller, such as the state of Ohio. Here Lorain County is found within the "North Central Mixed Farming and Fruit Region"⁵ (See Fig. 1). Even within this more limited region there is considerable diversity and subdivisions must be constructed. The "Western Lake Shore Fruit sub-region" and the "Interior Mixed Farming and Dairying sub-region" are both found in Lorain County. In defining her North Central Mixed Farming and Fruit Region, Miss Stevens said, "It is a transition region between the more intensified crop farming of western Ohio and the more intensified pasture farming of eastern Ohio. In the central part of the state the break is distinct between crop and pasture types, but in the north the change is more gradual and covers a wider territory."⁶

The present study is made with Lorain County as the unit of study, land use subdivisions being made within

⁴ O. E. Baker, "Agricultural Regions of North America, Part V - The Hay and Dairying Region", Economic Geography, Vol. IV, No. 1, Jan. 1928.

⁵ Margaret E. Stevens, A Geographic Interpretation of the Agricultural Regions of Ohio, Oberlin College Master's Thesis, 1933.

⁶ Ibid., p. 24.

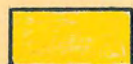
the county largely on a township basis. Three definite land use zones exist:

1. Dairying and General Farming
 2. Fruit, Commercial Vegetable, and Mixed Farming
 3. Commercial Vegetable and Fruit
- (See Fig. 2)

Here, then, is a northern Ohio, lake-bordering county, covering less than 500 square miles, whose land use is typically reflective of the strong geographic and cultural influences upon man's adaptation of his environment. In the following pages the three dominant use areas will be considered in the light of the specific influences in an attempt to explain the interrelationship of habitat and inhabitant.

Fig. 2. Land Use Regions of Lorain County.

KEY



Dairying and General Farming Region



Transition Townships of the
Dairying and General Farming Region



Fruit, Commercial Vegetable, and Mixed Farming
Region



Commercial Vegetable and Fruit Region

Fig. 2. Land Use Regions of Lorain County.

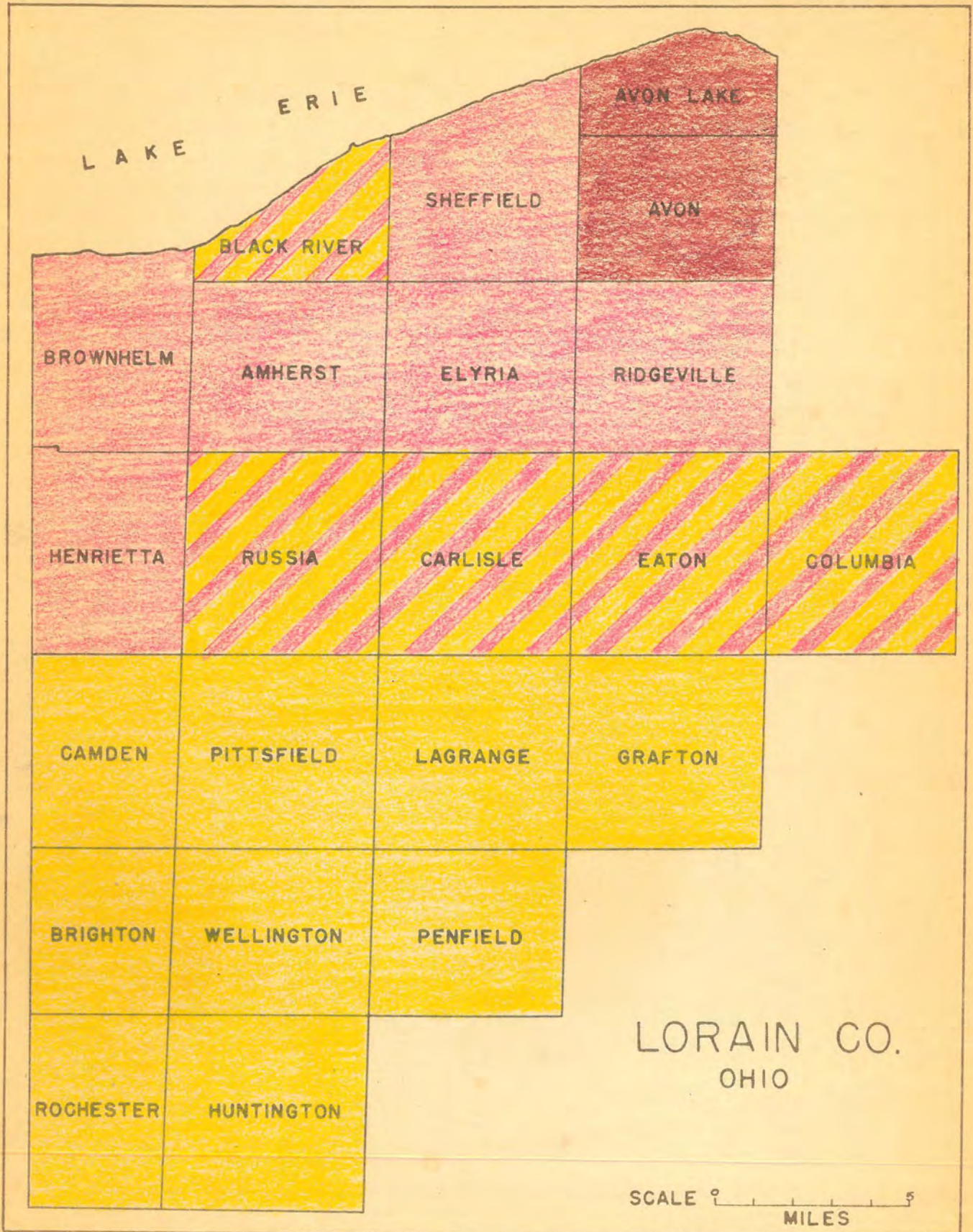


Fig. 2. Land Use Regions of Lorain County

THE GEOGRAPHIC SETTING

Lorain County is located just east of the center of the northern tier of counties in Ohio, its northern boundary formed by a portion of the southern shore of Lake Erie. Within its irregular borders are twenty-two townships. Although in 1940 78.6 per cent of the total land area of the county was in farms, at the same time only 15,767 people of the 112,390 total population lived on farms.¹ Thus on a population basis Lorain County is an urban county. About half of the people live in two cities, found in the northern portion of the county.² Lorain is an important lake port and steel manufacturing and fabricating center. Elyria, eight miles to the south, is the county seat and the site of increasing industrial expansion. Education is the function of Oberlin, the third largest city, home of Oberlin College. Amherst, a smaller city, is supported by its famous sandstone quarries.

An important "situation" factor in the development of Lorain County is its location immediately adjacent to the city of Cleveland. Sandusky and Toledo exert some

¹ Sixteenth Census of the United States, 1940, Agriculture, Vol. I, Part 1, County Table 1 for Ohio

² Sixteenth Census of the United States, 1940, Population, Vol. II, Part 5, Table 21 for Ohio

influence also. The county is crossed east-west by several state and two United States highways, US. 20 and US. 6, and state highways extend north-south. Several major railroads, freight and passenger, serve the county.

Climate

Climatic diversity is inevitable due to the variety and potency of controlling and modifying factors. As a result of its location in the interior of the United States northern Ohio feels the low winter and high summer temperatures of the Humid Microthermal Continental Climate. Warm-month temperatures average in the middle 70's while average cold-month temperatures are near 25 degrees. Because of its latitude, Lorain County is close to the boundary between Köppen's Dfa and Dfb climatic zones³, indicating that length of summers is near the lower limit of the long-summer phase and the upper limit of the short-summer phase of the Microthermal belt. Rainfall, averaging from 33 to 39 inches in the county, is about the general average for a continental type of climate. The rapid changes of daily weather are associated with cyclonic storms, which very often during the Autumn, Winter, and Spring follow the eastern Great Lakes and the St. Lawrence

³ R. B. Frost, "Lorain, Ohio - A Study in Urban Geography, reprinted from the Ohio Journal of Science, Vol. XXXV, No. 3

valley as they move eastward from the center of the continent onto the Atlantic Ocean. Precipitation, usually well distributed so that no month has less than 2 inches, occurs very often in winter as snow associated with passing cyclonic storms and outbreaks of polar air from central Canada. In summer, when cyclonic storms are weaker and many pass to the north of Lake Erie, much of the precipitation results from convectional activity typical of continental climates. Snowfall, although totalling 35 to 40 inches in an average winter, does not maintain a continuous cover in many years. However, the ground remains frozen from December to sometime in March.

A strong modifying influence on the climate of the lake counties, Lake Erie markedly affects the temperature, occasionally to a distance of 50 miles. Whereas growing season normally decreases with increasing Latitude, the temperature stability of the lake waters, as compared with that of land, causes a rapid increase in the length of the growing season in the short 28 miles from the southern boundary of Lorain County to the lake shore. The tempering influence is felt most in Spring and Fall when differences between land and water temperatures are greatest. Along the lake shore the average date of the last killing frost is April 15 and the first in the Fall,

October 30; comparable dates in the southern part of the county are May 10 and October 10.

The many dull, drizzly days of the Fall and Spring months, when a layer of stratus clouds is characteristic over Erie's southern shore, have been attributed to the cooling of air masses driven across the lake by prevailing northerly and northwesterly winds and addition of a small amount of moisture to the air masses from the lake, in conjunction with the nearby rise in land, often quite abrupt, at the edge of the Appalachian Plateau. Consequently, this region receives only about one-half of the possible hours of sunlight.

The accompanying climate chart (Fig. 3) for Oberlin, situated near the center of the county, shows the typical rainfall regime and march of temperature.

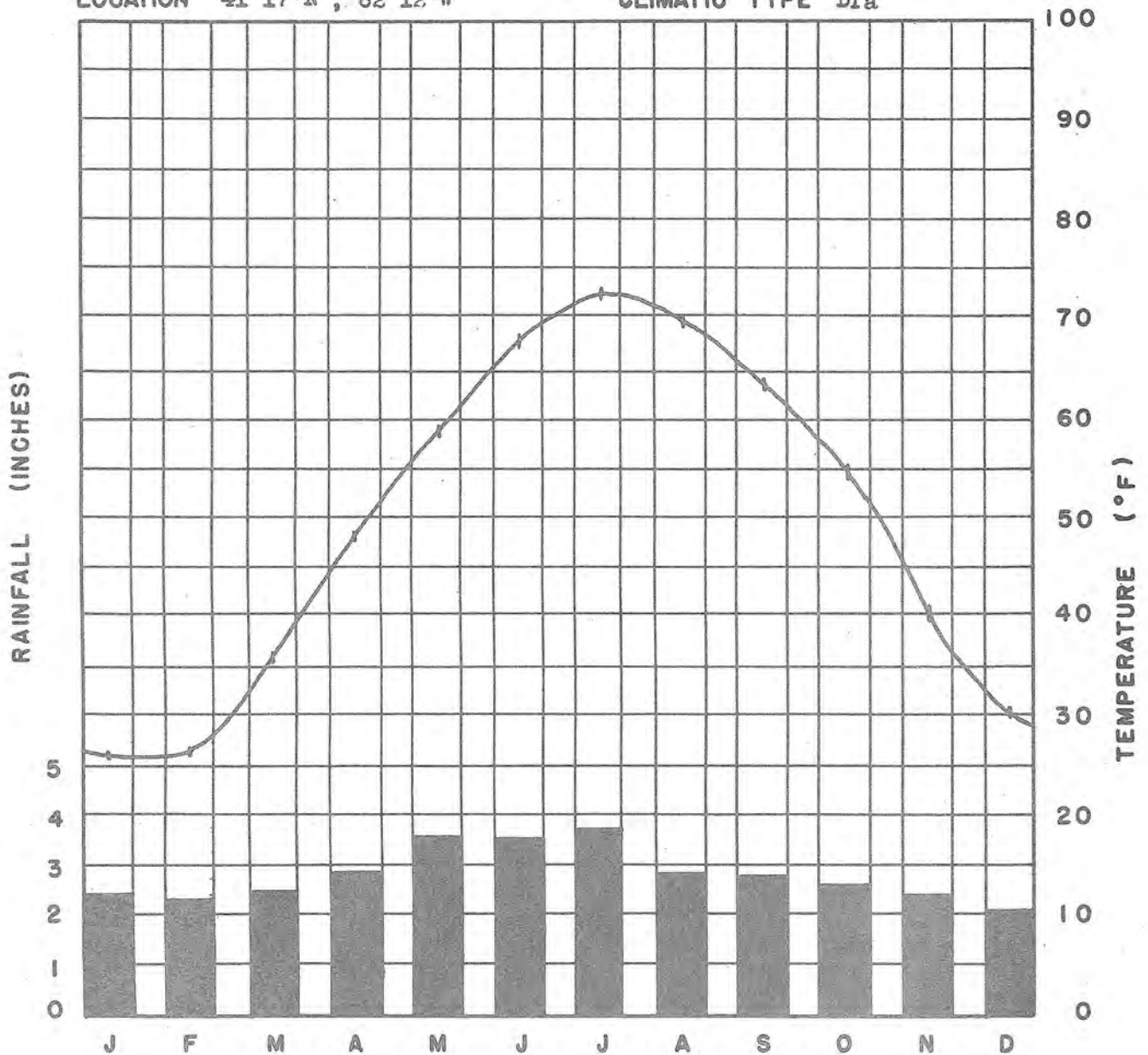
Topography⁴

Sloping gently upward to the south from the shore of Lake Erie, 573 feet above sea level, the glacier-subdued relief of Lorain County reaches its highest point 1120 feet above the sea along the Defiance moraine in the southern part of Huntington township. Extending south

⁴ Most information on topography obtained from Jessie Turk, The Artificial Drainage of Lorain County, Ohio, Master's Thesis, Oberlin College, 1947.

STATION Oberlin, Ohio.
 LOCATION 41° 17' N , 82° 12' W

ELEVATION 817 Feet
 CLIMATIC TYPE Dfa



MEAN ANNUAL TEMP. 49.2°F

RANGE 46.2°F

HIGHEST MONTHLY MEAN TEMP. 72.3°F

ANNUAL PRECIP. 33.46"

LOWEST MONTHLY MEAN TEMP. 26.1°F

ANNUAL SNOWFALL 39.5"

LENGTH OF GROWING SEASON 154 Days

Fig. 3. Climatic Chart - Oberlin, Lorain County, Ohio.

from the lake shore a distance of approximately 13 miles are the LAKE PLAINS. Although flat in appearance, this area consists of three step-like sloping plains, bottoms of three post-glacial stages of Lake Erie, separated by narrow, sandy ridges, varying in width up to one-quarter of a mile, and rising 20 to 30 feet above the lake plain adjacent to the north. These ridges are now believed to be beaches of the post-glacial lake stages. Between the present shoreline of Lake Erie and North Ridge, 6 miles to the south, lies the plain of Glacial Lake Warren; extending south from North Ridge 4 miles to Middle Ridge is the Glacial Lake Whittlesey Plain; the Glacial Lake Maumee plain, beginning at Middle Ridge, is marked along its southern edge by Butternut Ridge, which also forms the boundary between the Lake Plains and the TILL PLAINS. The thick, uneven glacial drift of the Till Plains has subdued a once rolling landscape to a plain, only slightly more rolling than the lake bottom plains. The Till Plains topography covers almost two-thirds of Lorain County, all the land south of the Lake Plains with the exception of a small area in the southeast portion where the GLACIATED PLATEAU section of the Appalachian Plateau projects into Columbia township. "The boundary between it and the Till Plains is mainly one of elevation, marked approximately

by the 800 foot contour line east of the West Branch of the Rocky River."⁵

Four areas of gently to heavily rolling land are found in the county: in the northwest, the Vermillion River has cut deeply into the unconsolidated lake bottom deposits; relief has become accentuated in the region of the Defiance moraine where numerous small streams have cut into the drift and morainic deposits; two small areas in the eastern part of the county, one in the Glaciated Plateau section, have been sharply dissected by the Rocky River.

Since the Ohio River-Lake Erie drainage divide is south of the Lorain County border, all surface water in the county drains into Lake Erie through three major stream systems, the Vermillion River, the Black River, and the Rocky River. These systems are post-glacial streams, still in a youthful stage which does not offer adequate drainage to the county. The three main rivers, in their lower portions, have deeply entrenched themselves through the soft, unconsolidated drift; valleys are wide and as the streams have tended to develop meanders, they present the appearance of early maturity.

⁵ Jessie Turk, Op. Cit., p. 12

Soils

Conforming to the Lake Plains physiographic region, reflective of the parent material, are the Lacustrine Sandstone and Shale Soils; the remaining three-quarters of Lorain County are covered by Glacial Sandstone and Shale Soils.⁶ Physical conditions of climate, vegetation, relief, and parent material have been enough alike so that the profiles of the mature soils developed in the whole county are those of the Gray-Brown Podzolic soil group. Under the humid climatic conditions, covered by a deciduous forest growth, pedalfer soil, rich in residual iron and aluminum, low in carbonate content in the A horizon but with a hardpan layer in the B horizon, is formed. Soils of the county vary in texture from sands and gravels to silty clay.

Lacustrine or lake-laid soils are "young soils, as far as soil development is concerned".⁷ For purposes of the land use maps accompanying this text, these soils have all been given the single classification "Lake Bottom Soils". Except for a few small areas, the Lake Plains soil is Caneadea loam, clay loam, and silty clay loam. There are

⁶ G. W. Conrey and A. H. Paschall, A Key to the Soils of Ohio, Ohio Agricultural Experiment Station, Special Circular No. 44, 1934

⁷ G. W. Conrey, "The Soils of the Glacial Lake Region of Northeastern Ohio", The Bimonthly Bulletin of the Ohio Agricultural Experiment Station, March-April 1927, Vol. XII, No. 2

Lorain clay loam and silty clay loam, Painesville fine sandy loam, and Wickliffe silty clay in patches through the Lake Bottom Soil region. Generally these soils are not too well drained; they are "retentive of surface water and become sticky in wet weather."⁸

Soils of the beach ridges in the Lake Plains, identified on the land use maps as "Ridge Soils (Sands and Gravels)", are Chenango gravelly loam, Berrien and Plainfield fine sand. These sandy, gravelly soils are well drained, the only sites in the entire county that do have good natural drainage.

The dominant soil type of the Till Plains and the Glaciated Plateau is the Mahoning silt loam; this soil and the Caneadea of the Lake Plains cover 90 per cent of the land of the county. Across the central portions of Rochester and Huntington townships is a belt of Ellsworth silt loam. South of this belt, in the Defiance moraine region, is found Rittman silt loam. Patches of Trumbull silt loam and Lordstown silt loam are scattered through the Till Plains. Parent material for all these soil types of the Glacial Sandstone and Shale group is late Wisconsin drift. (See Table I for soil characteristics)

⁸ Frost, Op. Cit., p. 143-44

Table I. Characteristics of Lorain County Soils

Soil Type	Color of Surface Soil	Important Textures	Natural Drainage	Topography
<u>LAKE BOTTOM SOILS</u>				
Caneadea	Brownish-gray to Gray	Silty clay loam Silty clay	Poor	Level
Lorain	Very dark Gray	Silty clay loam Silty clay	Very Poor	Level
Painesville	Grayish-brown	Fine sandy loam Silt loam	Fair to Good	Undulating to Gently Rolling
<u>BEACH RIDGES</u>				
Chenango	Brown	Gravelly loam Loam	Good .	Ridges
Berrien	Light Brown	Fine Sand	Fair to Good	Ridges
Plainfield	Light Brown	Fine Sand	Good	Ridges
<u>TILL PLAINS AND PLATEAU</u>				
Mahoning	Gray Brownish-gray	Silt loam Silty clay loam	Very Poor	Undulating to Gently Rolling
Ellsworth	Grayish-brown	Silt loam Silty clay loam	Fair	Undulating to Gently Rolling
Trumbull	Gray	Silt loam	Very Poor	Level
Lordstown	Brown	Stony loam Silt loam	Good	Rolling
Rittman	Light Brown to Grayish-brown	Silt loam	Fair	Undulating to Gently Rolling

(Derived from: G.W.Conrey and A.H.Paschall, A Key to the Soils of Ohio, Ohio Agricultural Experiment Station, Special Circular No. 44)

Soil Erosion

According to a soil erosion survey of Ohio made by the Ohio Agricultural Experiment Station, Lorain County has little erosion. This is due not to the character of the soils, for in general the rather impervious silt and clay soils are very susceptible to erosion since water penetration is slight and surface run-off great, but to the relatively level surface of the land. "The physical character of the soils of this area is favorable to erosion. The soils are heavy silt loams to silty clay loams with silty clay to clay upper subsoils underlain by heavy-textured lower sub-soils. Because of the tight, impervious nature of the subsoils, water penetrates very slowly and, were it not for the undulating to gently rolling topography with slopes seldom in excess of 5 to 8 per cent, the rate of erosion would be great."⁹

Rock Structure and Minerals

Controlled largely in structure by an east branch of the large anticlinal system known as the Cincinnati Arch, Lorain County bedrock slopes gently east since the axis of the arch lies some distance to the west in the vicinity of Fremont. Formations immediately below

⁹ Soil Erosion in Ohio, Ohio Agricultural Experiment Station, Bulletin 589, Wooster, Ohio, December, 1937, p. 18

the glacial drift, which varies in depth from 10 feet to 100 feet or more, are shales and sandstones of the Waverly series of Mississippian age, and shales of the Ohio series, Upper Devonian. Of this bedrock the only one of commercial importance is the Berea sandstone, a formation in the Waverly series, utilized for building and construction purposes. It has been quarried at various locations throughout the north central part of the county, but Amherst, claiming the world's largest sandstone quarry, is the center of the industry and the only site of present operations. No minerals of value are found in the county.

Bedrock as parent material of soil determines to a great degree the characteristics of the resultant soil type and profile. With sandstone and shale bedrock, and a predominance of shale, the texture of most of the Lorain County soils is fine, tending toward silt and silty clay loam. Initial lack of carbonates, as would be present in limestone, increases the tendency toward an acid soil; in the humid climate of northern Ohio, leaching has intensified greatly the soil acidity by removing much of the small amount of carbonate present in the bedrock. The pH factor of most of the soils of this region, which have not been treated with lime, is about 5.0.¹⁰

¹⁰ Liming Ohio Soils, Agricultural Extension Service, The Ohio State University, Bulletin 177.

HISTORICAL DEVELOPMENT OF LAND USE IN LORAIN COUNTY

The geographic elements discussed in the previous section are relatively stable over long periods of time: weather varies from day to day, climate from year to year, but over the decades and centuries the climatic pattern does not deviate far from a mean; soils vary from place to place, but in a given climate, with a similar parent material and vegetation, the same soil group profile is likely to result; topography and bedrock may change considerably when measured by geologic time, but in the course of two or three centuries the physiography of a region is not subject to radical change.

Man, however, is not of such stable character. He is subject, on the one hand, to adhesion to customs and traditions of his racial, national, and sectional group; but on the other hand, man is mobile, not tied by physical laws to one particular place on the earth, and as he travels about he attempts to adapt his surroundings to his customs and traditions. Furthermore, although slow to accept new scientific advances, new knowledge when time is measured by months or year, a span of several generations sees unmistakable change. Customs, traditions, and fund

of knowledge make up the "culture" of a people.

Land use is necessarily a function of both the geographic elements and the cultural. Furthermore, the specific use at any given time is determined by the stronger of these two elements: whether man must submit in his way of living to environmental conditions or can adapt, to some extent, the environment to the mode of life his culture demands. History seems to show that in a given area there is a gradual evolution from a primitive culture adapted to the land to an advanced civilization adapting the land. The contemporaneous stage in this evolution can be understood only in the light of the previous stages. It is, therefore, necessary in a study of the present land use of Lorain County to review the historical development of land use.

The history of Lorain County may be divided into five periods:

1. Habitation prior to settlement by white men
2. Early White Settlement
3. Agricultural Supremacy - 1825 to 1890
4. Rise of Industrialization
5. Modern Habitation

During the first period, the geographic elements largely determined use of the land; through the second and third periods cultural advance brought about a more equitable distribution of influence between geographic and

cultural factors; the last periods show evidence of cultural influence stronger than geographic.

Habitation Prior to Settlement by White Men

Little attempt was made by the Indians, or the Mound-builders before them if any inhabited the present Lorain County territory, to obtain from the land anything but its natural products. Until the advent of the first white pioneers, therefore, the land retained its natural state, yielding animals, wild fruit and nuts, berries, and herbs to the Indian hunter. No permanent Indian settlements seem to have been made here, but rather the land served as part of the hunting ground of the Eries, a tribe possibly connected with the Iroquois Nation.

The land sustained a dense forest cover, part of the Southern Hardwood Forest of the United States. "Primary vegetation studies indicate that this area was once dominated by beech and maple, with swamp forest on the poorly drained sites." Also, "on some sites, Oak-Hickory was found to be a definite type in this county."¹ Cranberries were native to the swamps and several other types of berries grew on the drier land.

¹ Karl Lindeman, Forest Resources of Lorain County, Ohio, Ohio Agricultural Experiment Station, Division of Forestry, Forestry Publication No. 68, p. 6

Early pioneers to Ohio found corn, beans, tobacco, and a form of potato cultivated by the Indians.² Although no definite record exists of such cultivation on Lorain County land, it is reasonable to assume that corn, beans, and the Indian potato may have been tilled in small natural clearings.

Early White Settlement

With the first pioneers came a new culture and the beginnings of a land use which over the next few decades was to revolutionize the face of the land which had existed in its natural state for many centuries. White men were not satisfied to live upon only what the land naturally produced. They began to clear the forests to make room for their cultivated crops.

The first permanent settlement in Lorain County was made at the mouth of the Black River, the present site of the city of Lorain, in 1807. A Moravian mission had been planted at nearly the same spot in the late 18th century, but failed to last.

The origin of the settlers of a new land has much to do with the manner in which it is developed. They

² John T. Brown, Agriculture in Ohio, Its Beginning and Development, Ohio Department of Agriculture, Columbus, 1940

tend to carry with them, as they migrate to a new territory, their customs and habits of living, and most important from the viewpoint of land use development, even the crops of their former home. "Move a people into a different physiography and for some time they will still be the children of their former surroundings."³ Moreover, routes of travel and ease of transportation to a new area, and the political status of that area determine the origin of the settlers. "Geographically Ohio is the back door of the middle and north Atlantic states."⁴ The earliest migration into Ohio took place through gaps in the Appalachians south of the Ohio River and earliest settlements were begun along the southern border of the present state, but few of these migrators, Virginians and Kentuckians who brought with them cotton and tobacco, and Pennsylvania Dutch, who introduced into the new territory the raising of livestock and the growing of wheat and oats, moved into northern Ohio. The first settlers of Lorain County followed a different route, the low pass of the Hudson-Mohawk valley. The location of this pass, and the political factor that the land of northeastern Ohio was claimed by Connecticut as its Western Reserve

³ Frank Carney, "Geographic Influences in the Development of Ohio", reprinted from Popular Science Monthly, Nov., 1909, p. 481

⁴ Ibid., p. 480

(Outlined on Fig. 1), encouraged New Englanders to try the new land of the frontier. Many towns within the former borders of the Western Reserve retain even today a characteristic New England appearance, with white churches and tree-lined streets and village green. From the rocky, pastured hills of New England the migrants brought to Ohio a dairying and cheesemaking economy for which the land of Lorain County, along with most of northern Ohio, happened to be well suited.

The well-drained beach ridges, destined to importance through the history of the county, were the sites of the first pioneer cabins, the first roads, "and these were the first places cultivated, because of their light sandy soil and easy cultivation."⁵ In periods of wet weather, not infrequent in the county, the ridges were the only even relatively dry ground, the lake plains becoming sticky swamps.

A government enactment, the Ordinance of 1787 for the Northwest Territory, prohibited slavery and "thus exerted a controlling influence, not only upon the agriculture of the Northwest, but also upon the future of its entire material and social progress."⁶ A political

⁵ Henry Howe, Historical Collections of Ohio, The Lane Printing Company, Norwalk, Ohio, 1896, Vol. II, p. 389.

⁶ Henry Howe, Op. Cit., Vol. I, p. 101

institution here set the pattern of small, privately owned farms instead of plantation-type; however, since the settlers of Lorain County were of New England stock, the chances are that this would have been the pattern without government action.

Early farms were small, three to five acres in extent, and of a self-sufficient nature. In clearing the forests, chopping was usually done during the winter months. The first wood cleared was used for erecting log cabins and sheds. After buildings were finished, some of the smaller logs were used in fences, and the considerable amount left was burned, the ashes gathered and leached, and the lye boiled into black salts. Asheries were established to convert the black salts into pot- or pearl-ash, a valuable product in eastern markets. Maple trees were tapped, the syrup and sugar consumed in the home, aiding in self-sufficiency.

Wheat was apparently the first crop, sown broadcast among the stumps after clearing and fencing had been done. For many years only crude farm implements were available; the wheat seed was scratched under the surface with a rude harrow called a drag, cultivation was accomplished by a metal-tipped, wooden, moldboard plow, and the ripe wheat was cut with a sickle or scythe. As

long as the farmers' tools were primitive and a great amount of hand labor was required, the size of farm was to remain limited.

In the spring grass or clover was sown among the wheat. After the wheat was cut, the no longer shaded grass grew rapidly, yielding a good hay crop. Corn was often planted on newly-cleared land in May in the northern part of Ohio; "white-flint corn (was) raised for many years, because it found such a ready market at higher price with the Hudson's Bay Fur Company".⁷ The influence of markets upon land use was therefore felt early in the history of Lorain County.

Population increased steadily after the first settlement and the land was cleared for cultivation. By 1853 more than 40 per cent of the forest had been removed from Lorain County. As transportation systems improved and cities grew, Lorain County entered a new period in its history.

Agricultural Supremacy - 1825 to 1890

While it remained a more or less isolated frontier settlement, farming in Lorain County remained on the subsistence level. Gradually, when markets became

⁷Henry Howe, Op. Cit., Vol. I, p. 104.

available, a farmer would enlarge his crop land so that he would have some surplus left over from the needs of his own family to sell. Impetus for the shift from subsistence to commercial farming was twofold: city populations, both on the Atlantic Seaboard and in the new Northwest Territory, were increasing rapidly and becoming more and more dependent upon rural regions for food supply; but simultaneously with city growth, a system of transportation had to be constructed in order to move farm products to the cities.

Over the period from 1800 to 1860 the population of Cleveland increased from 7 to 43,838;⁸ the rise of a large city, located in the county adjacent to Lorain, was a strong stimulus to the farmers of Lorain County. As early as 1837 Cleveland had four markets at which farmers sold their produce direct to the consumer.⁹

None the less a stimulus to the Lorain County farmers was the construction of highways and, even earlier, the canal system. Completion of the Erie Canal in 1825 made possible cheap water transportation of goods from

⁸ W. H. and M. R. Alburn, This Cleveland of Ours, S. J. Clark, Cleveland, 1933, p. 380

⁹ E. M. Avery, A History of Cleveland and its Environs, the Heart of New Connecticut, Lewis Publishing Co., Chicago and New York, 1918.

Northern Ohio to the growing east coast cities. Growing New England factory towns needed more food than New England farms could supply. Construction of canals into and across the interior of Ohio, connecting some of the central parts of the territory with Lake Erie and the Ohio River system, made possible their commercial agricultural development. The Milan Canal, finished in 1839, served for a few years as a funnel directing wheat from a considerable area, including the southwestern portion of Lorain County, to the town of Milan in Huron County, adjacent to Lorain on the west.¹⁰ Milan boomed as a wheat export center of Lake Erie to its peak year, 1847, when almost 920,000 bushels of wheat passed through the port.¹¹

Hardly had the canal system begun to function when the first railroads were pushed across northern Ohio; after 1847, Milan felt sharply the decline in canal shipments as railroads carried more and more of the farm products. From the middle of the 19th century the rail network became steadily more intricate. In 1860 there were 30,000 miles of railroad in operation east of the

¹⁰ C. G. Shatzer, "Geographic Influences in the History of Milan, Ohio", Ohio Archaeological and Historical Quarterly, Vol. XXIII, No. 3, July, 1914, Columbus.

¹¹ Ibid.

Mississippi, whereas in 1830 there had been none.

As city populations increased and demanded more food production from the rural areas, and improving transportation lines expanded the market area, farms in the county grew in size. This increase in farm acreage, however, could not be accomplished with crude implements. "By 1866 every one of the primitive methods of sowing, reaping, and threshing had passed into operation performed by machinery and driven by horse power. Agriculture had passed from hand production and the domestic consumption stage, into machine production and commercial importance." ¹²

Land use development reflected faithfully the influence of these major stimuli, as well as that of minor ones. From the beginning of commercial agricultural development first one crop and then another would rise to a peak of production and then decline as others became more important. "The emphasis in rural production was at first pastoral."¹³ The pattern of land use may be visualized and compared with the modern pattern represented on the utilization plates (I, IV, VII, X, XIII, XVI). For example, in the two decades from 1850 to 1870, North

¹² D. M. Love, "A History of Agriculture in Ohio", Seminar paper in Economics, Oberlin College, June, 1916

¹³ Inventory of the County Archives of Ohio, No. 47, Lorain County, prepared by: The Ohio Historical Records Survey Project, Division of Community Service Programs, Work Projects Administration, 1941, p. 6.

Central Ohio was the foremost area of sheepraising in the country; the center had shifted west from the Middle Atlantic states and after 1870 moved on to the Far West.¹⁴ Another contributing factor to the reduction in number of sheep in Ohio was the change in the tariff on foreign wool in 1883. In 1860 Ohio was the leading state in the production of wool; Lorain County declined from its peak of 286,265 pounds in that year to about one-quarter that figure, 74,014 pounds in 1940. In this period of sheepraising importance, from 50 to 60 per cent of the lands of Lorain County were still forested and a large percentage of the cleared land was pastured. Cities were small and the transportation system, especially the highways, was poor. Farms had increased in size, but much of the increase in cleared land had gone into pasture, so that cropland, although becoming greater, was still small in proportion. "More than half the improved lands in the county are pasture. A clayey subsoil overlaid by a good amount of vegetable matter appears especially adapted to grass."¹⁵

But sheepraising was not the only pastoral use

¹⁴ D. M. Love, Op. Cit. p. 23

¹⁵ N. S. Townshend, The Agriculture of Lorain County, Nevins and Myers, Printers, Columbus, Ohio, 1867, p. 17

of the land. Because Lorain County possessed "a soil which has proved excellent for pasture grasses",¹⁶ dairying was also an important phase of early agriculture. "The Dairy industry on the Western Reserve was started by the Connecticut settlers who brought with them improved methods of butter and cheese making."¹⁷ The evolution of farming emphasis from the subsistence farms of the early period to more specialized economy is mentioned by N. S. Townshend, writing at the time of the end of the Civil War. "The average size of farms in Lorain County is less than 100 acres. These small farms, or perhaps the original taste of the settlers, have led to the adoption of a miscellaneous agriculture rather than a dependence on one or two principal staples. Almost every farmer endeavors to raise whatever is needed by his own family, and some surplus of every product for market;"¹⁸ Even at this time the subsistence nature of the farms was strong. "While this is true in the main, the peculiar adaptation of this portion of the State to dairy purpose has given to this form of industry a preeminence, and secured for

¹⁶ Inventory -, Op. Cit. p. 1

¹⁷ D. M. Love, Op. Cit., p. 16

¹⁸ N. S. Townshend, Op. Cit., p. 8

Lorain, in common with other counties of the Western Reserve, the appellation of 'Cheesedom'.¹⁹ The dairy industry continued to expand after the decline of sheep-raising, reaching its peak in the late 1880's. At this time, Lorain County was the greatest cheese producing county in the state; the center of the industry within the county was the town of Wellington, in the heart of the present dairy region of the southern part of the county (See Fig. 2). Cheddar, English Dairy, and Western Reserve Factory, a local brand, were the major varieties of cheese manufactured. The best markets for Lorain County cheese at the time Townshend wrote were Cincinnati, St. Louis, New Orleans, and New York. River transportation was still important in determining markets, while the New York Central Railroad, following the lowland route of the Hudson-Mohawk valley, served the county as an outlet to the east.

Butter was also an important product of the northern Ohio dairy industry. Even in the late 1860's it could be stated that "For many years Lorain has sent butter of the best quality to Southern, Western, and Eastern markets."²⁰

¹⁹ Ibid., p. 8

²⁰ Ibid., p. 10

The dairy industry has continued to be an important part of the farm economy of Lorain County, but it has given way relatively to cultivated crops. The increase in cropland was due in part to the needs of the dairy industry itself, in part to improvement of railroad transportation, especially in the late 19th century, which resulted in a great increase in cereal crops.

Flax was for a time an important field crop in northern Ohio. In the early period it was grown in small amounts on each farm for household use. Linen markets in the east induced for a short period a large commercial production. "In 1869 Ohio produced nearly 80,000,000 pounds of flax fibre and had ninety flax mills in operation. In 1870 the tariff on gunny cloth grown in the East Indies was removed and as a result every flax mill in Ohio was stopped . . ."²¹ Here again is made clear the interplay of market conditions and political institutions which are influential in determining land use.

Oats and wheat acreage expanded greatly between 1860 and 1890, indicative of the influence of rail transportation upon cereal crop production. In 1880, Ohio was second only to Illinois in wheat production, with 49,790,475 bushels yield.

²¹ Henry Howe, Op. Cit., p. 105. No record exists of a flax mill in Lorain County, but flax was raised -- see Table II.

The extensive dairying industry, which began to feel the press for obtaining milk in all seasons, found necessary the "practice of cutting succulent green crops to feed to animals in their stalls when the pasture (was) insufficient."²² Among the field crops used for this purpose were rye, oats, peas and vetches, clover, lucern, young corn, and Hungarian and other millets.²³ The dairy industry did maintain and even increase the production of corn.

Table II gives the acreage by use on the farms in the county, and the yield of crops for the year 1887, close to the end of the period of Agricultural Supremacy.

Table II. Farm Acreage and Production, Lorain Co., 1887²⁴

<u>LAND USE</u>	<u>ACREAGE</u>
Cultivated	110,032
Pasture	106,403
Woodland	37,191
Lying waste	2,817

²² Ibid., p. 106

²³ Ibid.

²⁴ Ibid., p. 371

Table II (Continued)

<u>CROP</u>	<u>PRODUCTION</u>
Wheat	324,480 bu.
Oats	763,875 bu.
Corn	423,270 bu.
Rye	1,346 bu.
Buckwheat	104 bu.
Barley	6,405 bu.
Broom-corn	500 pounds brush
Meadow Hay	47,843 tons
Clover Hay	2,434 tons
Flax	34,100 pounds fibre
Potatoes	115,446 bu.
Butter	843,460 pounds
Cheese (greatest in state)	3,233,589 pounds
Sorghum	1,433 gallons
Maple Sugar	54,786 pounds
Honey	5,020 pounds
Eggs	422,855 doz.
Grapes	1,259,200 pounds
Wine	334 gallons
Sweet Potatoes	1,009 bu.
Apples	72,312 bu.
Peaches	14,308 bu.
Pears	833 bu.
Wool	121,809 pounds
Milch cows owned (second largest in state)	15,171

By 1887 woodland acreage had decreased to but 12 per cent of the total acreage of the county. Cultivated land and pasture had increased greatly, but the relative proportion was still about the same as in 1860. Changing land use was constantly remaking the pattern of the landscape.

Throughout this period of Agricultural Supremacy, the population increased, the forests were steadily cleared, and farmland created. Prior to the middle of the 19th

century most of the migrants to Ohio were of New England stock, who brought with them and maintained in the new environment to some extent New England traditions. "The large number of new arrivals in the late 1850's, however, reflected the greatly increased immigration into the United States after the revolutions and economic disasters in Europe in the late 1840's."²⁵ These new immigrants came largely from the German Empire, the British Isles, and British America. They necessarily brought with them some of their customs, but the agricultural pattern remained unchanged.

"In the 1880's the rate of increase (of population) fell off to 13 per cent, as the agricultural possibilities of the county approached a full exploitation."²⁶ Most of the land in the county, at all suitable for agricultural purposes, had been cleared and used. Before long, however, during the last decade of the 19th century, industrial development began to enlarge the cities and their populations.

Rise of Industrialization

Until the 1870's the population of Lorain County was more than 50 per cent rural. About this time, however,

²⁵ Inventory -, Op. Cit., p. 5

²⁶ Ibid., p. 6

the rural population became stable while the cities of northern Ohio were beginning to feel the impact of the Industrial Revolution. Agricultural production by no means decreased, on the whole, from the period of supremacy, but the growth of cities did bring about some further change in the emphasis. "Although its agriculture was still characterized by its diversity, more attention was now given to dairying, vegetable growing, poultry raising, and to those types of farming which are usually found near large consuming centers."²⁷ The influence of industrialization and urbanization have brought about the land use pattern of Lorain County as it exists today, subject only to specific modifications determined by increasing mechanization of the farms themselves, greatly improved transportation, especially the highways, and demands of the markets. The period of the Rise of Industrialization overlaps at its beginning the period of Agricultural Supremacy, and continues to the present in the period of Modern Agriculture.

²⁷ Carl Wittke, editor, The History of the State of Ohio; Vol. VI, "Ohio in the Twentieth Century", compiled by Harlow Lindley, Chap. IV, "Agricultural Changes", by John I. Falconer, Ohio State Archaeological and Historical Society, Columbus, 1942, p. 121

Modern Agriculture

The general land use pattern has remained much the same since the beginning of the Twentieth Century. The "Modern" period could be divided into three subdivisions: 1900 to 1930, 1930 to 1941, and 1941 to the present. The differences between these portions of the modern period of agriculture result from economic conditions and scientific advance. It has been largely during the period from 1941 to the present that the greatest change has taken place, primarily as a result of World War II. Changeover from horse power to tractors began in the county fifteen or twenty years ago, but it was not until the shortage of farm labor and increased demand of the war that Lorain County farms became mechanized in any great numbers. With the use of tractors and new types of farm machinery, farmers have for the first time in the county's history "really been farming their land".²⁸

Description and analysis of the agricultural use of the land in Lorain County at the present time, during this "modern" period, is the major problem of this paper and will be discussed in the following section, first in its entirety, then by the three dominant land use regions.

²⁸ From a conversation with R. J. Eglin. Mr. Eglin says that before the war most of the farmers of the county were able to cultivate only a part of their farmland because time would not allow them to plant all their fields using horse power. Several fields were usually left idle and although this was attributed to a desire to rebuild the soil it was largely a matter of the farmers' incapability to get to planting them.

LAND USE CHARACTERISTICS IN LORAIN COUNTY¹

General Survey

Considered in the light of distribution of population, Lorain County is predominantly urban. Of the 112,390 people living in the county in 1940, only 15,767, 7.1 per cent, were farm inhabitants.² However, on a land use basis the county is still rural, as 78.6 per cent of the total area is in farms.³

There is relatively little more land in farms at present than there was in 1887; Table I lists approximately 256,000 acres while recent tabulations show 279,619.

¹ Most of the data included in the study of land use in Lorain County is derived from the 1940 U. S. Census. The aerial photographs from which the use maps were prepared were taken in 1937. The land use pattern has not changed markedly during the interval.

² Sixteenth Census of the United States, 1940, Population, Vol. II, Part 5, Ohio, Table 21

³ Ibid., County Table I

Table III. Farm Acreage and Percentage, Lorain County, 1947⁴

<u>LAND USE</u>	<u>ACREAGE</u>	<u>PER CENT</u>
Crop land	167,020	59.7
Non-crop, open pasture	38,902	13.9
Woodland	27,783 ^x	10.0 ^x
Commercial Orchard	6,602	2.4
Commercial Vegetable Gardens	3,962	1.4
Commercial Potatoes	846	0.3

^xWoodland figures obtained from the United States Census of Agriculture, 1945, Advance Figures: Lorain County, Ohio, Dept. of Commerce, Bureau of the Census

One noticeable difference is seen in comparing Tables II and III: in 1887 Cultivated and Pasture land were almost equally divided; in 1947 the ratio is near 4 to 1. However, the total acreage cultivated and pastured is about the same. This difference may be explained by the fact that much land now pastured is utilized in the crop rotation and is not permanent pasture. It is therefore classified as Crop Land and as Pasture.

Idle land, land in farm roads, and in farmsteads makes up 12.3 per cent of the total land in farms in the county. This amounts to approximately 36,000 acres, an average of somewhat over 8 acres per farm.

⁴ Figures obtained from R. J. Eglin, Agricultural Conservation Program office, Elyria, Ohio

Gross farm income for the county in 1939 totalled slightly more than five million dollars. Of this, roughly 40 per cent was obtained from dairy products, 30 per cent from crop sales, potatoes, and greenhouse sales, 10 per cent from fruit, 10 per cent from vegetables, and 10 per cent from poultry.⁵ A more detailed analysis is obtained from the 1940 Census of Agriculture.

Table IV. Farms Classified by Major Source of Income⁶

<u>Major Source of Income</u>	<u>Number of Farms</u>	<u>Percentage of Total Number of Farms</u>
Dairy Products	1183	35.3
Products used on Farm ^x	817	24.4
Field Crops	390	11.6
Fruits and Nuts	296	8.8
Poultry and Produce	237	7.1
Vegetables	214	6.4
Livestock	149	4.4
Horticultural Specialties	67	1.9

^xFarms which would be considered subsistence type

⁵ From a conversation with the County Agricultural Agent, Elyria, Ohio

⁶ Sixteenth Census of the United States, 1940, Agriculture, Vol. II, Part 1, Ohio, County Table XX

By 1939 but 7.4 per cent of the land remained in woodland.⁷ Reference to the land use maps will show that these farm woodlots occupy a location with respect to roads typical of a once forested region. These woodlots are found usually toward the center of a section surrounded by roads whereas in the Great Plains states, where woods were planted for shade and as windbreaks, they appear close to the roads in the vicinity of the farmstead.

Four forest types are now found in Lorain County.⁸ The Beech-Sugar Maple type, making up 47 per cent of the total woodland, is recognized by ecologists as a climax type. It is characteristically found on moist, well-drained, upland soils, mostly in the southern and eastern portions of the county. A second major forest type, the Elm-Ash-Soft Maple, composes 39 per cent of the present county woodland and is found mainly on poorly drained sites. There are two minor groups, the Oak-Hickory (9.7 per cent), located on the heavy muck soils in the northern portion of the county, and the Flood Plain (3.9 per cent), largely sycamore, cottonwood, soft maple, elm, walnut, hard maple, and beech.

⁷ Karl Lindeman, Op. Cit., p.33

⁸ Ibid. Most of the information concerning present forest association has been derived from this source

Surveys have shown that many of the farm woodlots of the county are poorly managed; between 35 and 50 per cent are grazed, a practice extremely detrimental to good forest growth because of damage to trees by animals eating leaves and buds of the lower branches, because of destruction of small trees and plants by trampling, and through disturbance of the normal forest litter. If properly managed, the farm woodlot should provide a steady source of income to the farmer. Some approximation to natural vegetation growth will yield more annually than present exploitive methods. "This is unquestionably true as shown by recent surveys of maple sugar groves of Lorain County, Ohio,, shown to be less than 40 per cent efficient because they were pastured instead of being allowed to develop as normal small forests."⁹

Maple groves of Lorain County, typical of all three use regions although more characteristic of the "Dairying and General Farming", produce from 20,000 to 40,000 gallons of maple syrup annually. This furnishes considerable supplemental income on many farms.

⁹ Paul B. Sears, "The Ecological Basis of Land Use and Management", reprinted from Proceedings: Eighth American Scientific Congress, p. 230

Poultry raising is confined to no one use region but is prevalent throughout the county. Near the several cities a farm may specialize in poultry products. Many farms in the "Dairying and General Farming" region keep poultry for use in the household and for a small amount of supplemental farm income. Farms of the county reported in 1940 nearly 385,000 chickens, 7,900 turkeys, and 5,900 ducks.¹⁰

Three land use regions of Lorain County,

1. Dairying and General Farming
2. Fruit, Commercial Vegetable, and Mixed Farming
3. Commercial Vegetable and Fruit

have been delimited largely on a statistical basis; data obtained from the U. S. Census,¹¹ a Lorain County study,¹² and the Agricultural Conservation Program office¹³ were examined. Four indicators were utilized in classifying the townships of the county: percentage of non-crop or permanent pasture, a ratio of orchard acreage to permanent pasture acreage, a ratio of commercial vegetable garden acreage to permanent pasture acreage, and percentage of farms reporting whole milk sold. Permanent

¹⁰ Federal Farm Census, April 1, 1940, Ohio, by Counties and Minor Civil Divisions, United States Dept. of Commerce, Bureau of the Census, Tables 1 - 6.

¹¹ Federal Farm Census, April 1, 1940, Ohio Table 3

¹² Karl Lindeman, Op. Cit.

¹³ Courtesy of R. J. Eglin, Chairman, County Board, Agricultural Conservation Program, Elyria, Ohio

pasture acreage is reflective of a livestock raising economy. Percentage of farms reporting whole milk sold indicates the extent to which dairying is carried on commercially. Acreages of Commercial Vegetable Gardens and Orchards allowed a preliminary classification of townships into two groups: one, those reporting more than 100 acres of either gardens or orchards, considered to be supported not alone by a dairy economy, and two, those reporting less than 100 acres of gardens or orchards, considered to have a distinctly dairying economy. It was noted that as Garden and Orchard acreage increased there was a decided decrease in permanent pasture acreage. When the ratios of Vegetable Garden and Orchard acreages to Pasture acreage were computed (eliminating dependence upon the actual garden and orchard acreages which might be high in comparison with other townships as a result of differences in total farm acreage, but low in relation to other land use within the given township) and examined together with pasture acreage and milk sales percentages, a more detailed subdivision of townships into the three land use regions became quite evident, as shown in Table V.

Reference to Tables VI, XI, and X may clarify the reason for using the previously mentioned ratios as

Table V. Statistical Indicators of Lorain County
Land Use Regions

	Percentage of Permanent Pasture (PP)	Ratio- <u>Orchard</u> - <u>Pasture</u> Acreage (O/P)	Ratio- <u>Com. Veg.</u> - <u>Pasture</u> Acreage (V/P)	Percentage of Farms Reporting Whole Milk Sold (FM)	Average Number of Cattle Per Farm	Average Size of Farm in Acres	Land Value per Acre	Percentage of Farms Reporting Cattle which Reported Whole Milk Sold
1. Dairying and General Farming								
Regional Limits	10	.10	.10	50	14-9			
Penfield	24	.02	.01	70	14.2	106	49	78
Wellington	23	.00	.00	67	14.3	128	45	81
Rochester	22	.00	.00	89	10.2	135	37	98
Brighton	22	.00	.00	50	12.3	120	46	68
Huntington	18	.03	.00	94	11.9	111	39	100
LaGrange	18	.03	.01	68	12.3	77	58	75
Pittsfield	16	.00	.00	62	14.2	105	53	70
Camden	16	.03	.00	55	10.6	81	80	64
Grafton	12	.04	.01	74	12.3	85	47	81
Columbia	16	.07	.07	41	7.4	59	160	53
Black River	15	.07	.03	40	12.9	86	131	57
Eaton	12	.06	.10	64	9.0	71	73	72
Russia	12	.14	.00	52	9.8	72	83	52
Carlisle	10	.09	.05	42	9.5	63	125	62
2. Fruit, Commercial Vegetable, and Mixed Farming								
Regional Limits	5-10	.10-1.0	10-50	9-4				
Ridgeville	12	.22	.40	13	5.1	36	155	22
Henrietta	10	.47	.03	33	7.4	74	67	44
Brownhelm	8	.85	.19	36	7.5	63	86	48
Elyria	7	.60	.50	17	4.9	37	149	30
Sheffield	7	.61	.90	44	4.1	43	220	63
Amherst	7	1.02	.26	28	5.9	49	113	37
3. Commercial Vegetable and Fruit								
Regional Limits	5	1.0	1.0	0-10	4-0			
Avon	3	2.96	3.67	3	3.2	35	204	6
Avon Lake	2	9.35	.85	7	2.7	35	270	18

indicators instead of actual acreages; the same applies to use of percentage of farms reporting milk sold and percentage of permanent pasture of the total farm acreage. The aim has been ^{to} measure the relative importance of the various types of land use; to make an accurate comparison, the relative size of the total land in farms and consequently the actual acreages devoted to the various uses had to be disregarded. The percentages and ratios chosen as indicators appear to represent this relative importance of uses.

Field crop acreages occupy in the vicinity of 50 per cent of total farm land in all regions. Actually it will be found somewhat higher in the vegetable and fruit growing regions and somewhat lower in the dairying and general farming regions. This is to be expected since pasture land for the dairying economy, an extensive land use, covers much more area than vegetable gardens and orchards, where land use is intensive.

Several other sets of data aided in making the subdivision: average number of cattle per farm, average size of farms, land value per acre, and percentage of those farms reporting cattle which also reported whole milk sold. (See Table V) Generally, farms in the

dairying belt have a greater number of cattle and a higher percentage of milk sold than the other two zones. Farms on the average are larger in the dairy areas, and land values are lower than in the orchard and commercial vegetable garden zones.

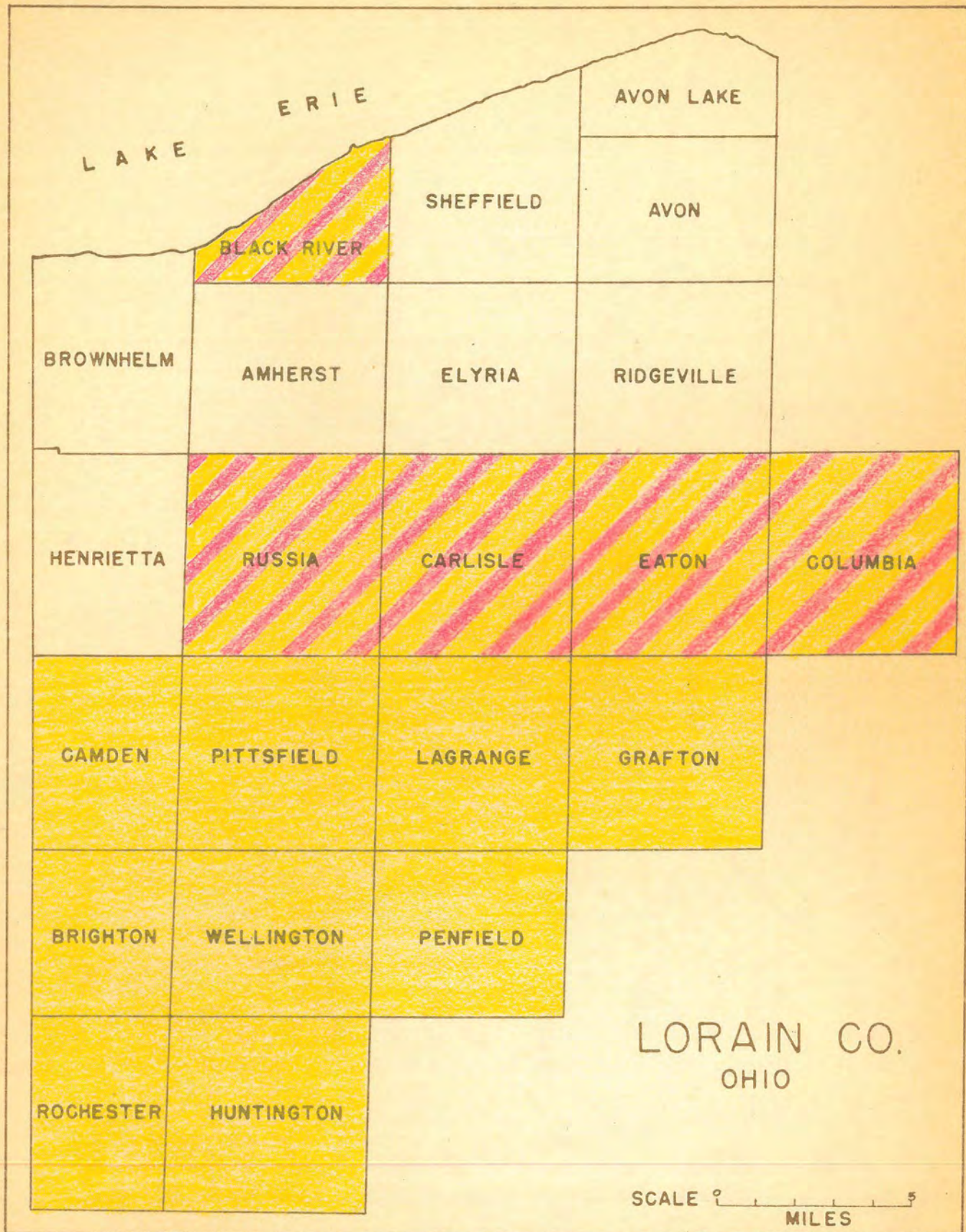


Fig. 4. Townships of the Dairying and General Farming Region

Region 1. Dairying and General Farming

Fourteen of the twenty-two townships of Lorain County, covering approximately the southern two-thirds of the county's area, lie within the region classified as "Dairying and General Farming". (See Fig. 2)

The Dairying and General Farming region is characterized by a relatively large percentage of permanent pasture (greater than 10), small Orchard-Pasture and Vegetable Garden-Pasture acreage ratios (less than .10), and relatively high percentage of farms reporting whole milk sold (greater than 50). (Note Table V)

Initial information obtained concerning the agriculture of Lorain County revealed that all the townships south of the southern borders of Brownhelm, Amherst, Elyria, and Ridgeville townships could be considered in the Dairying region. Analysis of the data of Table V showed that the nine southernmost townships (Rochester, Huntington, Brighton, Wellington, Penfield, Camden, Pittsfield, LaGrange, and Grafton) fell definitely within this region. In these townships the percentage of permanent pasture (PP) is greater than 16, Orchard-Pasture (O/P) and Vegetable-Pasture (V/P) ratios are less than .03, and greater than 50 per cent of the farms

report whole milk sold (PM) (Grafton is a lone exception in regard to the first two indicators - see Table V). The indicator values for Russia, Carlisle, Eaton, and Columbia townships, while generally meeting the requirements of the limits set for the region, are much closer to these limits and form a transition zone between the Dairying and General Farming region and the Fruit, Commercial Vegetable, and Mixed Farming region. The PM for Columbia and Carlisle is 41, well below the limit of 50, but the other three indicator values warrant including them in the Dairying region, as transitional townships.

Columbia, Eaton, Carlisle, and Russia townships have orchard and vegetable acreages considerably above 100 acres (Table VI), but because of large acreages of pasture, the O/P and V/P are .10 or less in Columbia, Carlisle, and Eaton, while in Russia the O/P is .14. These values close to .10 indicate the strong transitional character of the townships.

Black River Township, on the lakeshore, must be included in the Dairying and General Farming region because three of its four indicator values are within the limits set for the region. With a PM of 39 and an O/P of .07 it is also a transitional township.

Henrietta township, part of the initially delimited Dairy region, must be deleted and placed in the Fruit, Commercial Vegetable, and Mixed Farming Region.

Farms of the Dairying and General Farming region as a whole have an average of 11.5 cattle. In this respect also the transition zone is marked, for the nine dairying townships have an average of 12.5 cattle per farm while farms of the five transitional townships have only 9.7. In comparison, values for the farms of the Fruit, Commercial Vegetable, and Mixed Farming region are 5.8 and for the Commercial Vegetable and Fruit region 3.0.

Farms are much larger in Region 1 than in the other two regions. The average farm in the nine dairying townships is 105 acres, in the dairying transition townships, 70, in the Fruit, Commercial Vegetable, and Mixed Farming region it is 50 acres, and 35 acres in the Commercial Vegetable and Fruit Region. Land values are distinctly highest in the Commercial Vegetable and Fruit region and lowest in the Dairying and General Farm region. (See Table V)

Permanent Pasture acreage in the townships of the Dairying and General Farming region are the highest in the

county. Comparison of Tables VI, IX, and X will indicate this well. Cropland acreage is similar in all three land use regions.

Table VI. Farm Acreages of Region 1. 1947 (Courtesy R. J. Eglin)

	<u>Farm Land</u> <u>Acres</u>	<u>Cropland</u> <u>Acres</u>	<u>Non-Crop</u> <u>Pasture</u> <u>Acres</u>	<u>Com. Orch.</u> <u>Acres</u>	<u>Com.Veg.</u> <u>Acres</u>
Penfield	13,645	7,509	3,327	57	22
Wellington	13,432	6,528	3,123	17	4
Rochester	11,343	5,671	2,468	0	0
Brighton	10,398	5,944	2,246	3	0
Huntington	15,757	7,855	2,897	75	0
LaGrange	16,568	10,619	2,974	94	33
Pittsfield	16,496	9,254	2,609	7	4
Camden	12,561	7,945	2,049	59	6
Columbia	15,235	8,961	2,498	181	169
Black River	4,838	2,768	730	49	19
Grafton	16,158	9,944	1,950	71	22
Eaton	17,479	11,725	2,097	125	222
Russia	16,076	11,070	1,890	262	10
Carlisle	15,214	9,670	1,564	139	85

Geographic elements and the cultural background of the inhabitants throughout the county's history have combined their influence to produce the Dairying and General Farming Region.

With the exception of Black River Township, the growing season expected in the Dairy and General Farming region is 150 days or less, making attempts at fruit growing

on a commercial scale hazardous. Soils are largely silt loams, the Mahoning, Ellsworth, Trumbull, Lordstown, and Rittman, usually subject to poor natural drainage. (See Table I) These soils have proved to be good for field crops when artificially drained and treated with lime to neutralize the strong acidity characteristic of northern Ohio soils; they support an excellent growth of pasture grasses. The nearly flat surface makes possible extensive farming.

The origin of the dairying economy in Lorain County has been pointed out in the historical sketch (p. 28 ff.); settlers from New England brought to the new territory their traditional dairy farming, finding it well suited to this type of agricultural use. Once started in an area where the soil, climate, and topography could support it, the dairying industry continued to grow and has remained a predominant feature of Lorain County agriculture to the present.

Specific uses of dairy products or specific field crops grown during a certain period in the evolution of the dairy economy, however, have changed. From its early growth as a subsistence economy the industry rose to a peak cheese-making phase in the latter part of the 19th century. The cheese production declined in the 20th

century and today, although some butter is churned for marketing, the major emphasis of the industry is directed toward the sale of whole milk. Since the geographic elements have changed little, the explanation for rise and fall of emphases within the dairy industry must be found by analysis of historical and economic factors.

Simply, the answer lies in the progressive settlement of the United States. It was not until the whole country had been settled that centers of agricultural production became relatively permanent. As new territories were inhabited, they rose to peak production in some commodity for which they were better suited than the longer settled lands. So in many instances the centers of Agricultural production can be traced from the Atlantic Seaboard to a present location between the Appalachians and the Pacific Coast. The shift in the center of sheep raising and wool production has been mentioned. The cheese making phase of the dairy industry felt a similar shift from New England through northern Ohio to Wisconsin and Minnesota. Therefore, the cheese making stage in the evolution of Lorain County dairying was but a phase of the larger evolution of the dairy industry of the United States.

Of course, had northern Ohio been the most

suitable location in the country for cheese production, that stage would have been here the climax. However, as cities grew in the area, the fresh milk market was more influential than the cheese market. Improvement in transportation of fresh milk has greatly increased the milk shed area of an urban center. Whereas during most of the 19th century milk could not be marketed more than a few miles from the farm, making production of a less perishable product such as cheese imperative, modern milk-tank trucks and railroad cars have made practical the transporting of fresh milk hundreds of miles to markets.

Cleveland is the principal market for the whole milk of the Lorain County Dairy region. Lorain and Elyria supplement their local supply with milk from the northern portion of the region, while Amherst, Oberlin, and the several smaller cities and towns draw their supplies from a more limited area immediately surrounding their boundaries. Some of the milk which enters Cleveland from the county is now sent on to the Pittsburgh metropolitan district.

Farmers may sell their milk individually or belong to a milk dealer's association. Milk sold into Cleveland is now done largely through an association, which maintains collection routes through the dairy region.

Membership in such an association provides much greater security of a steady market than does the practice of selling milk individually.

The demands of an urban populace exert considerable influence upon the use of immediately adjacent land. City people have little opportunity, because of lack of space and time, to provide food for themselves. Hence around most urban centers are found vegetable farms supplying the city with fresh garden produce and dairy farms which supply a portion of the milk needed in the city. The location of the vegetable gardens and dairy farms is dependent upon climate and soil to large degree, and more recently the function of transportation has become important. Many dairy farms now found near cities are remnants of the era before rapid rail and highway transportation. High-priced land near cities is better used for vegetable gardens which supply high yield on a small area than for dairying which requires a large amount of land.

The combined influence of climate, soil, and urban demand have produced a transition zone in the four northern townships of this region. Beach ridges crossing Eaton and Carlisle townships are composed of fine sandy soil, well suited to vegetable cultivation. The northern

half of these townships, and also Russia and Carlisle, have a growing season of greater than 160 days, approximately the lower limit for orchards. Thus the geographic elements favor vegetable garden cultivation and raising of orchards. This alone would not adequately explain the increase in orchard and vegetable garden acreage over the townships to the south; urban demand for such products, providing excellent markets, is the further impetus to utilize this land for gardens and orchards rather than for dairying. Dairy products needs of the Cleveland metropolitan district may be met by farms in the area not suited to horticulture.

Geographic and cultural influences have made of Black River Township an isolated island of Region 1 located on the lake shore. The site of the first white settlement in Lorain County still reflects the tradition of a pastoral farm economy and the previously mentioned influence which a city, here Lorain, has in causing land of the rural-urban fringe to be used for dairying. Furthermore, only a small portion of the southeastern corner of the township is crossed by a beach ridge, accounting for the low vegetable garden acreage. Low orchard acreage may be accounted for by the fact that Black River township has large grape acreage; figures

were not available for land occupied by vineyards, but Black River is listed along with Avon, Sheffield, and Brownhelm as the major grape-producing townships of Lorain County. Hence, with large percentage of permanent pasture, low vegetable acreage, and moderately low Orchard-Pasture ratio, Black River has a land use pattern characteristic of the Dairying and General Farming Region.

As indicated by the name designating the Dairying and General Farming Region, many farms may receive their major source of income from dairy products, but they also operate poultry broods, raise other livestock, and obtain some income from sale of field crops. Poultry raising has been mentioned in the General Survey as typical of all three use regions.

Livestock raising and cultivation of field crops are also carried on in the three regions, but are more characteristic of the Dairying and General Farming Region. According to Table VII, the percentage of farms in the Dairying and General Farming region reporting cattle is generally in the high 80's or 90's, except for the transition townships. Percentages are lower in the other two regions. While it is true that the cattle reported may be dairy cattle, it is likely that there are more beef cattle in the Dairying and General Farming region where the total of all cattle is far greater than in the two

remaining regions. This assumption seems to be proven in part by the fact that farms in the Dairying and General Farming region report a smaller percentage of cattle milked.

Stock raising has not been of much importance in the agricultural economy of Lorain County, but it is one feature in the total picture of the land use. In the early settlement, little stock was kept beyond that needed by each family. "The impetus to stock raising came about strangely enough through the very difficulties in the way of other departments of farm work, i.e., through the inaccessibility to markets which forced down the prices of wheat and corn and hindered their production."¹ Stock could be fattened in farm feed lots and driven overland to eastern markets.

At the present time, range cattle are shipped into Lorain County to be fattened before being marketed. With the metropolitan district of Cleveland adjacent to the county, it is somewhat unexpected to find that most of the fattened beef cattle of Lorain County are marketed through the Chicago livestock market. It has been explained that the Cleveland market is poor and that farmers do better through Chicago.²

¹ D. M. Love, Op. Cit., p. 18

² Personal conversation with Mr. R. J. Eglin, ACP office, Elyria, Ohio

Table VII. Acreages of field crops, Percentage of Farms Reporting Cattle, 1940.

	Percentage of Farms Reporting Cattle	Corn Grown for Grain (Acres)	Corn Grown for Silage (Acres)	Winter Wheat (Acres)	Oats Grown for Grain (Acres)	Annual Legumes Cut for Hay (Acres)	Clover and Timothy Hay (Acres)
1. Dairying and General Farming							
Penfield	89	1303	253	1069	1131	497	1625
Wellington	82	940	307	849	898	473	1171
Rochester	90	935	80	640	917	387	967
Brighton	82	1001	57	676	906	397	1001
Huntington	94	1285	68	1012	1128	379	1397
LaGrange	90	1441	427	1176	1202	913	1898
Pittsfield	90	1361	558	1021	1557	567	1746
Camden	86	1178	247	1091	1122	562	1482
Grafton	91	1140	391	952	1161	586	1408
Columbia	77	1244	231	837	970	318	1371
Black River	70	280	109	327	161	113	290
Eaton	89	1609	337	1180	1369	492	1802
Russia	83	1255	363	1079	1485	172	2245
Carlisle	67	1397	238	993	1276	606	1761
2. Fruit, Commercial Vegetable, and Mixed Farming							
Ridgeville	60	1069	104	738	774	230	1546
Henrietta	75	1403	193	983	962	282	1218
Brownhelm	77	1154	168	840	757	145	773
Elyria	57	542	54	381	414	227	561
Sheffield	70	553	53	433	415	107	553
Amherst	76	1028	83	709	603	419	1020
3. Commercial Vegetable and Fruit							
Avon	58	928	14	573	558	97	1061
Avon Lake	38	194	--	114	153	19	254

(Data obtained from: Federal Farm Census, 1940, Ohio Tables 2, 4, and 5. Percentage of Cattle computed.)

Sheep and swine are kept on many farms.

Sheep raising has declined markedly in importance from the peak production period of the 1850's, 60's and 70's. Production in 1940 was but one-quarter that of 1860. Swine have never been very important in Lorain County, but many farms keep them, some for household use, some for marketing.

Several field crops are grown extensively throughout Lorain County, but the largest acreages are found in the Dairying and General Farming Region (See Table VII). The primary field crops are corn, ^{winter}wheat, oats, legumes for hay, clover and timothy hay, spring wheat, and soybeans. Alfalfa, rye, barley and buckwheat are grown in small amounts, but not worthy of more than mere mention.

As has been noted, northern Ohio in its natural state is not well suited to grain crops. However, with the aid of artificial drainage and the addition of lime the soils can be made fit for good field crops. One of the main functions of the Agricultural Conservation Program in the county today is aiding the farmers to finance drainage and liming. Labor costs for installing tile drains on farms are in part met by the government. Cost of lime for neutralizing the strongly acid soil,

thereby increasing annual yield and conserving the mineral fertility of the soil, comes under ACP subsidy. An example of the increased yield gained by annual liming is given in Table VIII.

Table VIII. Yields of Crops Grown on Limed and Unlimed Soils, 1917-1931³

<u>Crop</u>	<u>Unlimed</u>	<u>Limed</u>	<u>Gain by Liming</u>
Corn	23.6 bu.	45.8 bu.	22.2 bu.
Oats	36.0 "	49.0 "	13.0 "
Wheat	17.7 "	27.9 "	10.2 "
First year Hay	1288 lbs.	3405 lbs.	2117 lbs.
Second year Hay	1496 lbs.	3684 lbs.	2188 lbs.

Wheat, Oats, and corn have been important crops throughout the agricultural history of Lorain County. Crop rotation is not definitely standardized in the county, but a rotation which seems to be followed by many farmers (according to a conversation with the County Agricultural Agent) covers a four year period: corn, wheat or oats, hay, and pasture. A second rotation reported by Mr. R. J. Eglin is corn, oats, wheat, and hay.

³ Data taken from Table II, "Yields and Value of Crops Grown on Limed and Unlimed Soil, 1917-1931", found in Liming Ohio Soils, Bulletin of the Agricultural Extension Service, The Ohio State University, No. 177, May, 1938. The experiment was not run in Lorain County, but indicates the value of liming acid Ohio soils.

Since many farms have been changing from use of horses to operate farm machinery to tractor power, the amount of oats grown is decreasing. The oats phase of the crop rotation is replaced by a crop new to the county on a large scale within the last fifteen years, soybeans. The soybean enters the farm economy as hay, grain, for hogging off, or use with corn for silage. Furthermore, many soybeans are grown in Ohio for industrial purposes, providing the farmer with cash income. "The Ford Motor Company obtains more than 90 per cent of its soy beans from independent growers living within a distance of 200 miles of Dearborn. The number of farms in southern Michigan, northern Ohio, and northern Indiana producing soy beans has increased some 300 per cent since 1932 under the stimulus of a ready market."⁴ Here is a good example of an economic factor causing a change in the agricultural economy of an area.

Two sets of maps have been made to illustrate the land use of the Dairying and General Farming Region. Rochester is the southwesternmost township in the county and typifies those townships of distinct dairy and general farm economy. No acreage of commercial vegetables or commercial orchard is reported for the township.

⁴ J. A. Russell, "Synthetic Products and the Use of Soy Beans", Economic Geography, Vol. XVIII, No. 1, Jan., 1942, p. 95

Russia represents the five transitional townships in the northern portion of the Dairying and General Farming Region.

Base maps were prepared, as discussed in the Appendix. On the basis of the key numbers, representing land use, slope, and soil, a set of three maps for each township was colored. Comparison of the Rochester and Russia maps will illustrate the difference between the land use patterns of the two types of economy within the Dairying and General Farming Region. Note that the two maps are not of the same scale, therefore individual features of land use on the Rochester will appear somewhat larger than those of Russia.

Pasture lands and wood lots are clearly larger and cover a greater percentage of the farmland in Rochester Township than in Russia Township. Table VI shows that while in Rochester cropland acreage is about twice that of permanent pasture, in Russia the ratio is greater than five to one. There is a noticeable lack of orchards in Rochester. The orchards in Russia are fewer in the southern half of the township. Reference to the Land Use - Soil Type map for Russia (Plate V), shows that orchards are equally numerous on the two soil types of the northern half of the township and one of

these types extends throughout the southern half as well. Probably the climatic change southward from the lake is the most influential element in determining orchard location and Russia lies in the border zone within which the growing season becomes too short and the temperature extremes too great for large scale commercial orchard cultivation.

Soil type does not strongly influence the land use in either Rochester or Russia. There are three soil types found in Rochester Township, but the land use pattern for the whole township varies little (Plate II). The change in use pattern in Russia, decreasing number of orchards and increasing pasture acreage (very slight) from north to south has been noted as a result largely of climate and not of soil change.

Plates III and VI illustrate slope in the two townships. In both Rochester and Russia much of the land with greatest slope, usually associated with streams, is used as pasture or wooded land. More of the Class 2, 3 and 4 slopes in Russia Township are utilized for crop land than in Rochester. There is very little land in Rochester which has a slope greater than Class 2, a maximum of 6 degrees, but in the southeastern part the land is slightly more rolling than in the rest of that township or in Russia where most slopes occur along stream valleys.

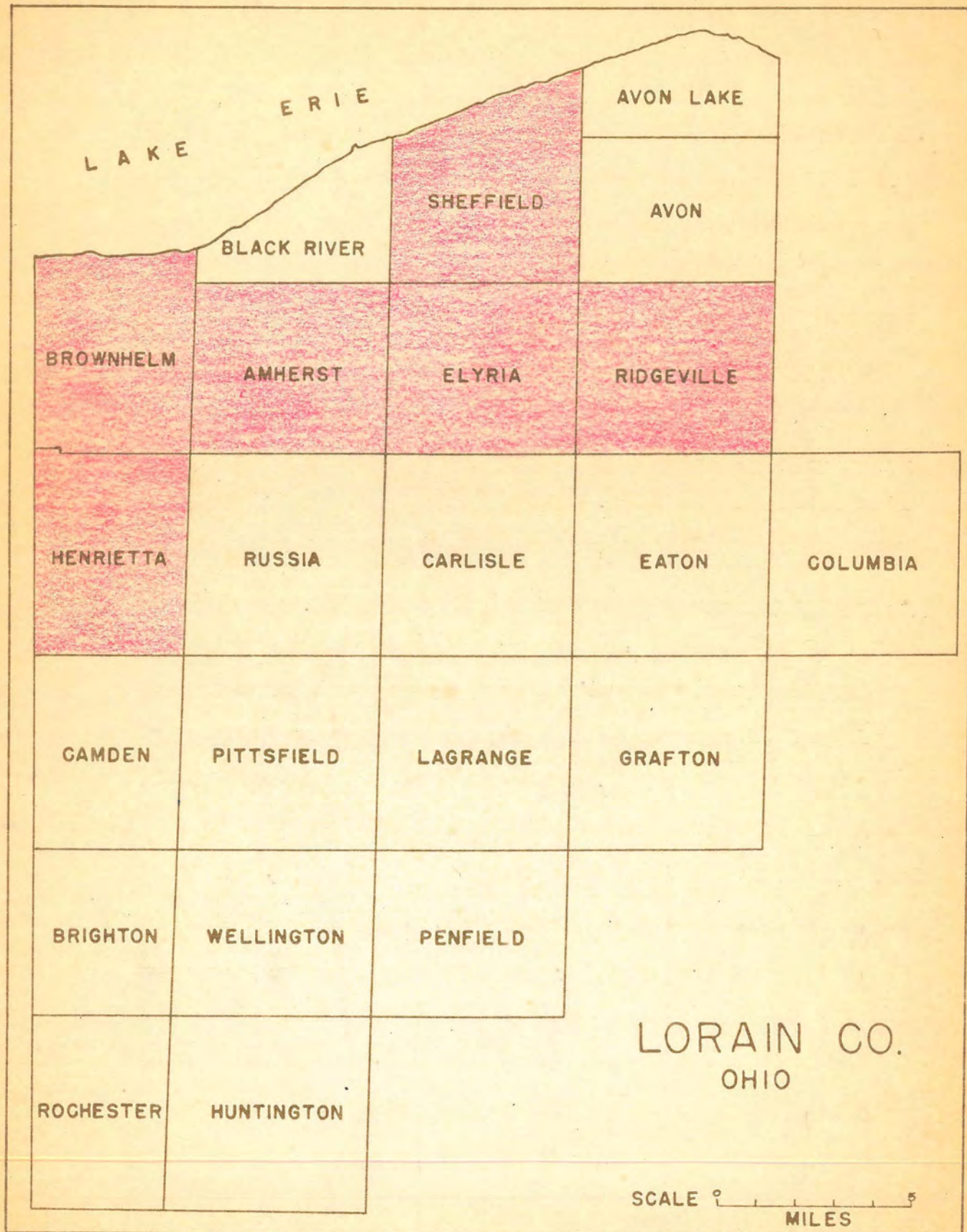


Fig. 5. Townships of the Fruit, Commercial Vegetable, and Mixed Farming Region

Region 2. Fruit, Commercial Vegetable, and
Mixed Farming

North of the Dairying and General Farming region there are six townships in which the importance of dairying decreases and that of commercial orchards and vegetable gardens increases. This is the Fruit, Commercial Vegetable, and Mixed Farming region. It is actually a transition zone between the dairying region, of high pasture percentages and low indicator ratios for vegetable gardens and orchards, and the Commercial Vegetable and Fruit region, with low pasture percentages and high indicator ratios. Permanent pasture percentages are between 5 and 10, with the exception of Ridgeville where it is 12. Orchard-Pasture ratios fall between .10 and 1.0 for Ridgeville, Henrietta, Brownhelm, Elyria, and Sheffield while Amherst is not far outside the 1.0 limit with 1.02. Henrietta shows a low Vegetable-Pasture ratio (.03), but the remaining five township values lie between .10 and 1.0. In all the townships the percentage of farms reporting whole milk sold is between 10 and 50. The moderately large permanent pasture percentage and the fact that in four of the six townships between 25 and 50 per cent of the farms report whole milk sold

(Ridgeville 13 and Elyria 17) emphasize the transitional character of the region where dairying is still carried on to quite an extent while the commercial orchards and vegetable gardens have become considerably more important than in any part of the Dairying and General Farming region.

The orchard and vegetable acreages in the six townships of Region 2 are well over 100 acres, except for Henrietta whose vegetable area is only 36 acres, so that in the initial two-group division this region was part of the area not supported by dairying alone. The moderately high pasture acreage and percentage of milk-selling farms resulted in separate classification for these townships. However, the average number of cattle per farm is only 5.8, much below that of the Dairying and General Farming region (11.5), but somewhat above that for Region 3 (3.0). The average size of farms is 50 acres; land values are higher than in Region 1, reflecting the increase in small, intensively used farms.

Comparison of Table IX with Tables VI and X will show the transitional character of acreages of pasture, orchards, and vegetable gardens. Cropland acreage is not noticeably different from either Region 1 or 3.

Table IX. Farm Acreages of Region 2. 1947
(Courtesy of R. J. Eglin)

	<u>Farm Land</u> <u>Acres</u>	<u>Cropland</u> <u>Acres</u>	<u>Non-Crop</u> <u>Pasture</u> <u>Acres</u>	<u>Com.Orch.</u> <u>Acres</u>	<u>Com.Veg.</u> <u>Acres</u>
Ridgeville	13,403	9,272	1,679	362	668
Henrietta	13,683	7,970	1,384	652	36
Brownhelm	12,324	6,501	971	823	184
Elyria	7,300	4,782	537	324	268
Sheffield	7,685	4,886	528	324	478
Amherst	12,849	7,686	898	919	237

Growing season is shortest in Henrietta township, probably 160 days or slightly less at its southern border, and longest in Sheffield, where it approaches the county maximum of 192 days. The average for the region is 164 to 178 days, which makes orchards possible on a commercial scale. Soils over most of Region 2 are Lacustrine Sandstone and Shale Soils, the Caneadea, Lorain and Painesville types. Several beach ridges cross the region composed of Chenango gravelly loam and loam and the Berrien and Plainfield fine sand. The well-drained beach ridges and areas of Painesville fine sandy loam (Brownhelm Township) are the sites of the vegetable farms. Most of Henrietta township is covered by Glacial Sandstone and Shale soil of the Mahoning silt loam type, with a few

small areas of Lordstown silt loam. Land use patterns are determined largely by characteristics of vegetable gardening and orchard culture; under such intensive agriculture, land area devoted to gardens and orchards is small when compared with other types of land use, but high yield per acre indicates its importance.

The geographic elements of climate and soils encourage the fruit and commercial vegetable industries of this region. It is the location of the six townships with respect to urban centers that has tended toward retention of some characteristics of the adjacent Dairying and General Farming region. Elyria, Amherst, and Lorain provide markets for dairy products which results in use of some land in the vicinity of these cities being utilized for dairy farms. Hence the transitional pattern of land use is reflective of the interplay of geographic elements and cultural features.

Since the characteristics of the land use are more fully discussed under Regions 1 and 3, where they are seen as dominant features, repetition will not be made here. Characteristics of the dairying in Region 2 are similar to those of the Dairying and General Farming region and the vegetable garden and fruit industries are similar to the economy of the Commercial Vegetable and

Fruit region. The fact that two such different types of land use occur together in one region does not modify the characteristics of either use as compared to the region in which such use is dominant. Neither is there a conflict between the two uses for given parcels of land because within the region soil type is a strong determinant of utilization: ridge soils are best suited to orchards and vegetables, glacial lake bottom soils to pasture and field crops.

Field crops are important in the Fruit, Commercial Vegetable, and Mixed Farming region, but the acreage devoted to them is somewhat less than in the Dairying and General Farming region (Table VII). Field crops are grown largely on the glacial lake bottom soils. It is because of the moderately high acreage devoted to field crops, as well as the use of some land for dairying, that the region must be classified a Mixed Farming area. The relative amount of corn grown for grain to that grown for silage is higher than in Region 1, as would be expected where dairying is carried on to less extent. Legume hay acreage also decreases from Region 1 for the same reason; however, acreage of timothy hay is similar, a fact which is accounted for by use of the hay as mulch and packing in the orchard

and vegetable industries.

Illustrative maps have been prepared for Henrietta and Amherst townships as typical of the Fruit, Commercial Vegetable, and Mixed Farming region. The two land use maps for these townships differ in that Henrietta has no vegetable garden area shown. There are 36 acres of vegetable gardens in Henrietta but these are not concentrated; they would therefore be included as parts of farmsteads. In this township the vegetable gardens would occur along the highway crossing Henrietta diagonally from east to west in the northern portion (Plate VII). The map showing the relationship of land use pattern to soil type (Plate VIII) indicates that the beach ridge is not strong enough to be separately identified. The major soil type of the township is the Mahoning silt loam, more typical of the Dairying and General Farming region. It is this feature, and not the influence of urban centers, that causes the higher percentage of permanent pasture and dairying economy more characteristic of the adjacent dairying region. As in Rochester and Russia townships, the land of greater slope is wooded to great extent. Slopes are associated with streams (Plate IX).

In Amherst Township much of the beach ridge land is used for vegetable gardens (Plate X). Less area is devoted to permanent pasture, which is found mostly in regions of lake bottom soil away from the beach ridges. Vegetable garden zones are found to extend beyond the beach ridge soils a small distance into the lake bottom soils, which due to their proximity to the ridges are no doubt mixed with the fine sand and sandy loam, and do receive, furthermore, the benefits of the excellent drainage of the ridges (Plate XI). Again, the greater slopes are associated with streams and are wooded or pastured.

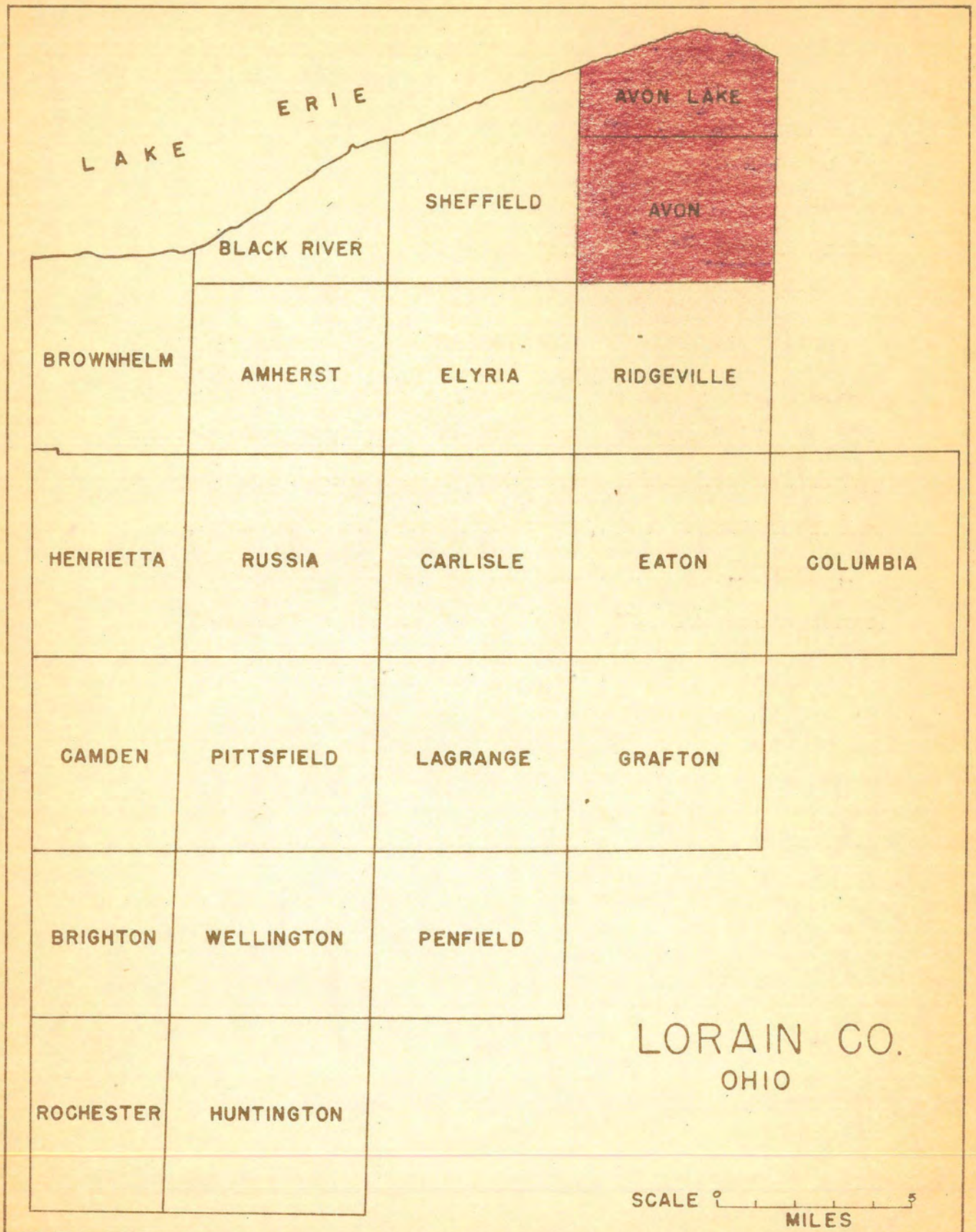


Fig. 6. Townships of the Commercial Vegetable and Fruit Region

Region 3. Commercial Vegetable and Fruit

Avon and Avon Lake townships, located in the northeastern corner of Lorain County, have highly developed vegetable garden zones along the beach ridges and a large number of commercial orchards. These two townships form the area designated as the Commercial Vegetable and Fruit region. Theoretically, if climate and soil were the sole determinants of land use, this region should extend westward along the lake shore through Sheffield, Black River, Amherst, and Brownhelm townships and south from Avon into Ridgeville township. In this whole block of townships, existence of the beach ridges with fine sandy soil which is excellent for growing truck crops and a climate which will not kill apple trees or other orchards, in conjunction with a ready market in the Cleveland metropolitan district, explains the use of land for vegetable gardens and orchards. However, in the townships other than Avon and Avon Lake, demand of urban centers for dairy products aids in explaining the amount of land devoted to the dairy industry, which is high enough to make it necessary to classify these townships as Fruit, Commercial Vegetable, and Mixed Farming. Avon and Avon Lake townships,

reporting very low pasture acreage and percentage of farms with whole milk sold, lack almost completely any dairying and must be classified in a separate group.

The Commercial Vegetable and Fruit region is characterized by very low permanent pasture acreage (less than 5), the highest Orchard-Pasture and Vegetable Garden-Pasture acreage ratios in the county (greater than 1.0), and less than 10 per cent of the farms reporting whole milk sold. The average number of cattle per farm is 3.0, the lowest in the county, in contrast with 11.5 in the Dairying and General Farming region and 5.8 in the Fruit, Commercial Vegetable, and Mixed Farming region. Farms are generally small, the average being 35 acres, the land values are high, over 200 dollars per acre in 1939.

Cropland covers a high percentage of the total farm land as in Regions 1 and 2. The noticeable difference in comparing Table X with Tables VI and IX is the small pasture acreage and high commercial vegetable and orchard acreage in the Commercial Vegetable and Fruit region.

Table X. Farm Acreages of Region 3. 1947 (Courtesy of R. J. Eglin)

	<u>Farm Land</u> <u>Acres</u>	<u>Cropland</u> <u>Acres</u>	<u>Non-Crop</u> <u>Pasture</u> <u>Acres</u>	<u>Com.Orch.</u> <u>Acres</u>	<u>Com.Veg.</u> <u>Acres</u>
Avon	12,525	8,029	385	1,143	1,412
Avon Lake	4,650	2,431	98	916	83

Growing season in Avon and Avon Lake is longer than 180 days. A further factor of climate is important, both in the Commercial Vegetable and Fruit region and in Region 2, in minimizing damage to orchards by low temperatures: "It must be remembered that not only does the large water body prolong the autumn season and keep early frosts from attacking the fall fruit, but the cold raw winds from the lake delay the spring season so that the buds are not forced too early and then damaged by a late spring frost."¹

Soils are the same as in the Fruit, Commercial Vegetable, and Mixed Farming region: Caneadea, Lorain, and Painesville lake bottom soils, and Chenango, Berrien, and Plainfield ridge soils.

¹ Margaret Stevens, Op. Cit., p. 27

Apparently Avon and Avon Lake townships are outside the sphere of influence of Cleveland and Lorain as far as dairying is concerned, or it may be that a former dairying industry has been forced out by land use which yielded more profit on this soil and under this extremely lake-modified climate. The geographic elements suitable for vegetable growing and orchard raising were present, but again it has been the urban demand which has caused the high degree of development of the region. The direction of development was due in part to what C. C. Colby has called the "Centrifugal Forces" in urban development. During the 1920's Rocky River and Lakewood, residential suburbs of Cleveland, were expanding. Many men who had vegetable farms in the region of this expansion were forced to move westward into the eastern townships of Lorain County, along the same ridges which they had farmed farther east. Thus these men developed North Ridge, which extends across Avon Township westward into Sheffield Township. The inconvenience of moving was off set by expanded markets as area enlarged the demand for products from the vegetable gardens and orchards.

The characteristics of vegetable gardening and orchard raising are similar in the Commercial Vegetable

and Fruit, and Fruit, Commercial Vegetable, and Mixed Farming regions.² Soil types are the same, climate varies some but the source of influence is identical, and markets are the same. Most vegetables grown in Lorain County are marketed in Cleveland. The change in mode of transportation from wagon to truck has increased the distance from a city at which it is profitable to specialize in perishable garden produce. "The near-by vegetable grower no longer has a monopoly on the home market, neither is he limited to the local market for an outlet."³

A great variety of vegetables is grown in Lorain County. Early in the spring, cabbage, celery, beets, and cauliflower plants are started from seed in hotbeds. These so-called "frost-proof" vegetable plants are set out in the gardens before the danger of frost

² The discussion here applies to both regions, since it was omitted in the preceding section. Actually, personal interviews with a vegetable grower and orchard operator were made in townships located in Region 2: Vegetable farm of W. B. McAllister, Sheffield Township, and Harvest Hill Orchard in Henrietta Township. Information obtained from these sources applied to vegetable gardening and orchard raising in the county as a whole, not just their own vicinities.

³ The History of the State of Ohio, edited by Carl Wittke, Ohio State Archaeological and Historical Society, Columbus, 1942, Vol. VI, p. 126

is over. Tomatoes, peppers, egg plant, and mustards are also started in hotbeds, but are not transplanted until after frost-danger is past. Spinach, carrots, beets, peas, beans, sweet corn, cucumbers, and melons are planted as seeds directly in the outdoor gardens.

Tomatoes, peppers, egg plant, sweet corn, cucumbers, and melons are single crops, yielding one harvest a year. The other vegetables are harvested and new seeds planted so that crop yield may be obtained several times each year. The value of vegetables harvested for sale in 1939 in Lorain County exceeded \$300,000.⁴

Good drainage is the most important factor in making the sandy, gravelly ridge soils excellent for vegetables. However, since the porous ridge soils do not retain moisture, most vegetable farmers find it necessary to irrigate their gardens during dry periods of the summer. Irrigation is accomplished largely by means of stationary or portable overhead piping systems.

The ridge soils are quite low in organic content and must be heavily fertilized to support vegetables. A large amount of nitrogen must be added to the

⁴ Sixteenth Census of the United States, 1940, Agriculture, Ohio County Table XIII

soil.

About fifty per cent of the vegetable gardeners do their own marketing while the other half sell their produce to commission houses in Cleveland from where it is distributed to retailers. Marketing produce through roadside stands is a practice not so much of the larger truck farms as of gardeners who work two or three acres. One of the densest roadside market areas in Ohio is found along highway U. S. 20 east of the city of Elyria in Lorain County.⁵

The greenhouse flower and vegetable industry in the vicinity of Cleveland is worthy of a complete study in itself. It is only practical to mention here that quite a few vegetable garden operators also maintain greenhouses, thereby continuing to supply markets almost throughout the year. Tomatoes, cucumbers, leaf lettuce, and radishes are among the most common greenhouse products. Lorain County has at the present time about 100 acres of greenhouses.

Commercial orchards occupy over 6,500 acres in Lorain County, the majority being located in the

⁵ Roadside Marketing of Agricultural Products by Ohio Farmers, Ohio Agricultural Experiment Station, Bull. 521, Wooster, Ohio, March, 1933, Fig. 1

Commercial Vegetable and Fruit and Fruit, Commercial Vegetable, and Mixed Farming regions. The townships of these regions are closest to the lake, therefore they have the advantage of a long growing season and the tempering effect of the lake. Some commercial orchards are found in the northern half of the transition zone of the Dairying and General Farming region, which also feels the temperature moderation due to Lake Erie. Disappearance of orchards from the land use pattern south of the line marking approximately 160 days growing season has been pointed out in the discussion of the land use map for Russia Township (Plate IV). Climate seems to be the main influence upon use of land for orchards; Ridge, lake bottom, and glacial soils all support orchards where the climate is suitable.

Apples are the primary orchard crop; peaches, pears, plums, and cherries are also grown, but not to the extent of apples. Most apple orchards grow a number of varieties: Jonathan and Red and Golden Delicious are grown for eating apples, Baldwin and Rome, called "winter apples" because they are harvested late and last through the winter well, are raised for cooking. Wealthy and Stayman varieties are used for either purpose.

Many of the apples grown in the two fruit regions of Lorain County are marketed in Cleveland through commission houses which distribute them to retailers in the Cleveland area. Many orchard operators, however, sell a portion of their crop directly to consumers at the orchards or through their own roadside stands.

Several cider mills are located in Lorain County which use a quantity of locally grown apples each Fall. Another market for Lorain County apples is apple butter factories, one of which is located near Wooster, Ohio, at Orrville in Wayne County.

An important feature of the townships which border directly on the lake, Avon Lake, Avon, Sheffield, Black River, and Brownhelm, is vineyard culture. "Most vineyards are located on the lake plains and on the two or more low sand and gravel ridges paralleling the lake shore and closely adjacent to it, east and west of Cleveland."⁶ Lorain County ranked second in the state for grape production in 1940.

Location of vineyards is largely a function of climate; a growing season of less than 160 days is

⁶ Grape Growing in Ohio, Agricultural Extension Service of the Ohio State University, Bull. 250, p. 3.

undesirable for most varieties of grapes. Within the area of suitable climate, soil type may determine use of land for vineyards. "The best vineyards in Ohio are growing on moderately fertile, well drained sandy or gravelly loam (4 to 6 feet rooting area) which contains a good supply of organic matter. In general, the lighter sandy type of soils promote earlier ripening and higher sugar content of the grapes than do heavier soils."⁷

Since the soils of the beach ridges and adjacent lake bottom are not high in organic content, cover crops are utilized to supply organic matter and also to reduce erosion. Soybeans have been found to be good for cover in young vineyards; often rye is sown as a cover crop in older vineyards.

Both red and white grapes are grown in the Fruit regions. Many grapes are marketed in the Cleveland region for household consumption. Some vineyards supply wineries; Lorain County at one time had several wineries, but does not at present.

Land use maps have been prepared for both Avon and Avon Lake townships. Both townships show noticeable lack of large permanent pasture acreage. Avon Lake has

⁷ Ibid., p. 6

many orchards and Avon Lake a large area of vegetable gardens as well as many orchards (Plates XIII and XVI). (In comparing Plates XIII and XVI with similar plates for other townships, note that scales differ). Soils of Avon Lake are all similar, lake bottom types. There is little garden acreage accounted for by lack of a beach ridge (Plate XIV). No vineyards or market gardens appear on the Avon Lake map; difficulty of distinguishing them, as explained in the Appendix, has resulted in this inaccuracy. Ridge and muck soils are seen to be fairly well correlated with the vegetable gardens of Avon Township (Plate XVII). In Avon also there are no vineyards mapped, as was noted for Avon Lake. Most of the land in Avon and Avon Lake townships is nearly level. Slightly sloping areas accompany stream beds, and in Avon, are associated with the beach ridge (Plates XV and XVIII).

CONCLUSION

Through the medium of maps and tables, the present land use patterns of Lorain County, Ohio have been presented. An attempt has been made to explain the existing patterns as a stage in an incessant evolution, resulting from influences of tradition, scientific knowledge, and political, economic, and social pressures upon man as he endeavors to understand his environment and utilize it to his best advantage. The inherent and extraneous geographic influences are relatively stable; further change in the land use pattern will be brought about through modification in the cultural development of the inhabitants of the region. Such change is slow insofar as cultural modification of a people is slow. Geographic influences indicate that Lorain County land use will remain largely as described in the three use regions. What modification occurs will be mainly change in specific crops and farming technique, brought about by expansion of urban centers, difference in urban demand for food produce and raw materials for industry, increasing mechanization of farming, scientific advance with respect to agriculture, and improvement of transportation.

APPENDIX

CONSTRUCTION OF LAND USE MAPS

Six sets of land use maps have been constructed to illustrate the land use patterns in relation to slope of the land and to the type of soil for the three major regions of Lorain County. A set of maps, one for each of the six typical townships, consists of three maps showing: (1) land use pattern; (2) slope; (3) land use pattern and soil type. A basic map for each township was constructed upon which all three factors were noted by key numbers; this basic map could be colored by various combinations of the key numbers to emphasize the land use pattern and physical elements.

Base maps showing roads and property lines were obtained from the Lorain County Engineer's office in Elyria. Using aerial photographs of the county (1937) possessed by the Oberlin College Geography Department, six types of land use, plowed land, permanent pasture, woodland, orchards, vineyards, and vegetable gardens, were outlined and transcribed free hand to the base maps. Farmsteads, defined as the area utilized by farm buildings, houses, household gardens, and adjacent land apparently used as stock yards, lawns, and small orchards, were

also outlined and transcribed to the base map. Occasional difficulty in interpreting the aerial photographs accounts for some inaccuracies on the final maps. Idle land was not distinguishable from permanent pasture and therefore falls in that classification. Vineyards were extremely difficult to distinguish on the photographs, therefore there are not the number of vineyards shown on the maps of Avon and Avon Lake Townships that should be found. However, in some cases vineyards have been included within the market garden area. There is no accurate method of distinguishing between plowed land for field crops and that for vegetable gardens except by relative size and previous knowledge that most all of the vegetable gardens lie on or immediately adjacent to the beach ridges. Woodland areas were checked by the map accompanying Lindemen's Forest Resources of Lorain County, Ohio.

Slopes were outlined in four classes on the United States Geological Survey Topographic maps of the townships (Oberlin, Vermillion, Berea, and New London quadrangles). The four classes used correspond very closely to those suggested as limits in the glacial region of Ohio^x: class 1, (0 to 2 degrees) corresponds to class A (0 to 3 per cent), class 2 (2 to 6 degrees)

^x Soil Erosion in Ohio, Ohio Agricultural Experiment Station, Bulletin 589, Wooster, Ohio, December, 1937, Table 3

to class B (3 to 12 per cent), class 3 (6 to 12 degrees) to class C (12 to 20 per cent), and class 4 (greater than 12 degrees) to class D (greater than 20 per cent). Slope outlines were transcribed from the Topographic sheets by means of a pantograph.

A soil map accompanying a Master's thesis at Oberlin College by Jessie Turk (see Bibliography) was used to outline soil types.

Using these preliminary maps, a composite map was constructed upon which the key numbers were placed. The key number identifies the type of land use, as one of the six classifications, slope, as one of the four classes, and soil type, as one of the 8 major types of Lorain County. Map one of each set (Plates I, IV, VII, X, XIII, and XVI), illustrating land use patterns, was made by coloring on the basic township maps the areas outlined by heavy solid lines within which the land use is identified by the left hand digit of the key number. Map two of each set (Plates III, VI, IX, XII, XV, and XVIII), illustrating slope of the land, was made by coloring the areas within the light solid lines, identified as to slope class by the middle digit of the key number. Map three of each set (Plates II, V, VIII, XI, XIV, and XVII), illustrating land use in conjunction

with soil type, was made by coloring the edge of the use areas by the use digit of the key number, then filling in the areas of soil type outlined by the dashed lines and identified by the right hand digit of the key number.

These sets of maps have been discussed separately in the section they illustrate. Comparison of two or more maps will serve to make the differences between the land use regions much more clear.

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