

A GEOGRAPHICAL STUDY OF MAURY COUNTY, TENNESSEE

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Bachelor of Science

Tennessee State College

Murfreesboro, Tennessee

1945

Submitted to the Faculty of the Graduate School of  
the Oklahoma Agricultural and Mechanical College

in Partial Fulfillment of the Requirements

for the Degree of

MASTER OF SCIENCE

1950

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## PREFACE

This study considers the geographic setting, the characteristics of the people and the utilization of the land and mineral resources of Maury County, Tennessee.

The writer grew to adulthood on a farm in this county that has been tilled for more than a hundred years by three generations of her ancestors. She taught in both rural and urban communities and observed the problems and progress of the people. It is intended that this study shall be a contribution to the people of Maury County.

An attempt is made to give a geographic interpretation of land uses in Maury County and to show how man adapted his physical activities to the prevailing environmental factors: climate, relief, and edaphic resources; how by trial and error he established an economy reasonably well suited to the area which is based on the utilization of the available natural resources.

The methods employed in this research study include field work in several communities of the county, personal interviews and correspondence with people living in the area, and library research through numerous government documents, state publications, newspapers, magazines and other printed matter containing information relevant to Maury County.

Although the county lies within the watershed of the Tennessee River, none of the hydroelectric establishments of the Tennessee Valley Authority are located within the county. Electric power is transmitted to the urban settlements from the power development at Muscle Shoals, Alabama.

A detailed study of the urban centers and their manufacturing and industrial developments has not been included in this paper. They are considered only in

so far as they are related to or influential upon the rural activities of Maury County.

The writer wishes to express her gratitude to the staff of the Geography Department of Oklahoma Agricultural and Mechanical College, and especially to Professor Robert C. Fite under whose direction the study progressed, to Dr. Edward E. Keso for valuable suggestions on the final preparation of the study, and to Professor George S. Corfield for initial help in selecting reference material for the study.

Sincere appreciation is due the Library Staff of Oklahoma Agricultural and Mechanical College for their untiring efforts in locating materials; and to Dr. George I. Whitlatch, Director of the Tennessee State Planning Commission; Richard F. Haynes, Assistant County Agent; Mrs. Ruell Sellers, Teacher in Whitthorne Junior High School, Columbia, Tennessee; and numerous others who took time from their busy schedules to furnish valuable information on the subject.

B. C. G.

STRATHMORE PARCHMENT

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## TABLE OF CONTENTS

<u>Chapter</u>		<u>Page</u>
	Preface . . . . .	iii
	List of Figures . . . . .	vii
	List of Tables . . . . .	viii
I	Introduction . . . . .	1
	Location . . . . .	1
	Organization of Study . . . . .	3
II	Physical Characteristics . . . . .	5
	Physiography and Topography . . . . .	5
	Climate . . . . .	7
	Drainage . . . . .	11
	Edaphic Resources . . . . .	12
	Natural Vegetation . . . . .	15
III	Cultural Development . . . . .	16
	Transportation . . . . .	16
	Population Characteristics . . . . .	19
	Population Trends . . . . .	25
	Geographic Influence on Population Centers . . . . .	26
IV	Agriculture . . . . .	29
	Farm Crops . . . . .	30
	Forest Resources . . . . .	38
	Conservation Practices . . . . .	40
	Economic Factors . . . . .	42
V	Livestock . . . . .	43
	Cattle . . . . .	43
	Horses and Mules . . . . .	47
	Other Livestock . . . . .	51
VI	Phosphate Resources . . . . .	53
	Location and Origin of the Phosphate Rock in Maury County . . . . .	53
	Prospecting . . . . .	57
	Mining Operation . . . . .	58
	Treatment of Phosphate Rock . . . . .	58

## TABLE OF CONTENTS (Continued)

<u>Chapter</u>		<u>Page</u>
VI	Phosphate Resources (Continued)	
	Labor . . . . .	62
	The Problem of Strip Mined Areas . . . . .	63
	Fluoresis . . . . .	66
	Phosphate Reserves and Future of the Industry . .	66
VII	Summary . . . . .	69
	Bibliography . . . . .	74

## LIST OF FIGURES

<u>Figure</u>		<u>Page</u>
1	Map of Tennessee Showing Location of Maury County . . . . .	2
2	Graph Showing Mean Monthly Temperatures and Precipitation .	10
3	Map of Maury County with Major Soil Associations . . . . .	13
4	Map of Tennessee Giving Distribution of Milk Cows in 1948 .	44
5	Map of Middle Tennessee Counties Showing Location and Distribution of Phosphate Deposits . . . . .	56
6	Phosphorus Plant at Night . . . . .	61
7	Picture Depicting Open Pit Stripping Method of Mining . . . . .	61
8	Tennessee Valley Authority Hydroelectric Sub-Station . . .	61

## LIST OF TABLES

<u>Table</u>		<u>Page</u>
1	Racial Characteristics of Maury County's Population in 1940 . . . . .	22
2	Population Trends in Maury County . . . . .	25
3	Land Use in Maury County . . . . .	30
4	Acreage and Percentage of Cultivated Land for the County's Six Major Crops . . . . .	32
5	Acreage and Yield of Crops Produced in Maury County . .	34
6	Saw Timber and Cordwood Reserves in Maury County . . . .	39
7	Saw Timber Reserves in Maury County by Specie . . . . .	40
8	Registered Stallions Enrolled in Maury County . . . . .	48
9	Livestock Produced in Maury County . . . . .	49
10	Phosphate Companies Operating in Maury County . . . . .	62
11	An Estimate of Brown Phosphate Reserves in Tennessee, June, 1939 . . . . .	67



## CHAPTER I

## INTRODUCTION

Maury county's well-being, as that of any area, is determined by two factors: (1) the condition of the land and the resources that lie under the land, and (2) the ability and ingenuity of its people to use these resources wisely.

This county with its contrasting physical divisions offers a unique opportunity for a geographical analysis. It is one of the best agricultural counties of the state; however, the topography and soils differ greatly in their characteristics and ability to produce. These contrasting physical conditions in turn create noticeable cultural differences among the divisions of the county.

Maury county is famous for its fine Burley tobacco and for its livestock--many registered Jersey herds, blooded horses and mules. The "Dimple of the Basin" is rich in tradition and history. Along the highways of the countryside are many beautiful ante-bellum homes. The grandeur of the Old South still exists in Maury County.

Geographical Location

Maury County, situated in South Central Tennessee at the extreme western edge of the Nashville Basin, is comprised of Basin and Highland Rim country (Figure 1). A dividing ridge on the north separates Maury County from Williamson County; Elk Ridge, a divide between Elk and Duck rivers, separates the county from those of Giles and Lawrence on the South. Marshall County lies to the east while Lewis and Hickman form the western boundary. Maury County, somewhat rectangular in shape, has an average length east and west of about

# MAP OF TENNESSEE SHOWING LOCATION OF MAURY COUNTY



SOURCE U.S.G.S.

FIG.1

twenty-six miles and a mean width north and south of approximately twenty-two miles. It contains 618 square miles or 395,520 acres and has a population of 40,357, predominately rural in character.

### Organization of the Study

After considering the environmental factors of climate, relief and edaphic resources of Maury County, one can better understand the cultural development of the area. Modes of transportation, productivity of the soil and in many respects the mineral resources, and even the characteristics of the people have been greatly influenced by these physical factors.

Since the majority of the people of Maury County depend on agriculture for a livelihood, emphasis is placed on the kind, quantity and quality of crops, farm practices, conservation problems, and various economic factors affecting agricultural activities. Diversity of the agricultural program in Maury County is one of its outstanding features and provides for a stable farm economy which is reflected in the well-being of the inhabitants.

Livestock production is an integral part of the farm production and contributes heavily to the cash income of the farmer. Dairy farming, a comparatively new activity in Tennessee, has been expanded into large scale operations and competes with the raising of beef cattle, "walking horses," mules, hogs and sheep for the available pasture of the area. Some of the finest livestock of the nation, especially of certain breeds, are bred and produced in Maury County.

Phosphate mining and processing are vital factors in the county's economy, although the acreage involved is a small portion of the total land area. Its importance to local and regional agriculture, as a competitor in the labor market and as a source of vitally important fertilizers, demands that it be

considered in this study. The mining and processing industry is also of great importance to the county and state on account of the large number of people dependent on it for a livelihood.

## CHAPTER II

## PHYSICAL CHARACTERISTICS OF MAURY COUNTY

Physiography and Topography

Situated on the low plateaus of the interior plains, Maury County contains parts of two major physiographic sections of the Tennessee region, namely, the Highland Rim Plateau and the Nashville Basin.<sup>1</sup> The Highland Rim, a plateau in a stage of dissection ranging from youth to maturity, surrounds the Basin as a remnant of a plain which formerly extended entirely across the Basin. The Rim Country of Maury County has an elevation from 950 feet to 1,000 feet above sea level.<sup>2</sup> The formation of the Highland Rim peneplane was ended by a gradual elevation of Middle Tennessee which formed the Nashville Dome. The rate of rise was greatest along the axis of the present Nashville Basin, but the uplifting movement was slow enough to allow the major rivers, Cumberland, Duck and Elk to maintain their courses across the fold.<sup>3</sup>

The hard basal cherts of the Mississippian rocks were thinnest in the center of the dome. The rejuvenated streams soon cut through these cherty layers and exposed the easily eroded Ordovician limestones. Rapid erosion of the limestone strata formed a basin, small at first, but gradually enlarging as erosion continued. The erosion and widening of the Basin continued until about the end of the Pliocene time when there seemed to be a pause in the

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<sup>1</sup>Nevin M. Fenneman, Physiographic Divisions of the United States, Map.

<sup>2</sup>United States Department of Agriculture, Soil Survey, Maury County (1923), p. 153.

<sup>3</sup>Richard Smith and George I. Whitlatch, Phosphate Resources of Tennessee (1940), p. 11.

tectonic movement.<sup>4</sup> Uplifting was renewed and continued to about the middle or end of the Pleistocene period when another pause occurred.<sup>5</sup> Most of the Nashville Basin reached its present size during this period. The incised streams in the area indicate that there has been some recent uplifting of the county. The Basin reflects the aggregate result of the work of the streams, both small and large.

As a result, two types of landscape, quite distinct geologically and geographically, lie within the Basin area of Maury County. These two areas, usually designated as the "Inner Basin" and the "Outer Basin," contrast greatly. The Inner Basin with little relief represents that part of the Basin where peneplanation was most highly perfected in this division. Although underlain with Lower Ordovician Stone River and Middle Ordovician Lowville limestones, this section exhibits as the widest outcrop, the Lebanon limestone described as thin and platy.<sup>6</sup> The cedar glades are characteristic of this area. They are rocky places, generally flat, originally covered with red cedars. Large tracts of these glades lie along Duck River in the eastern part of the county. Limestone depressions or karst topography also characterize the Inner Basin.

More rolling than the Inner Basin and with greater relief, the Outer Basin lies on the periphery of the peneplaned area. This area includes the Highland Rim remnants or knobs. Erosional ridges project from the plateau and continue as rows of outliers or isolated knobs into the interior of the Outer Basin. They are most noticeable in the south and western parts of Maury

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<sup>4</sup>Nevin M. Fenneman, Physiography of Eastern United States (1938), pp. 434, 442-443.

<sup>5</sup>Ibid., pp. 442-443.

<sup>6</sup>United States Geological Survey, Water Supply, No. 677 (1936), p. 13.

County. Weathering of the Ordovician limestone formations, the Bigby and Hermitage, forms a very fertile and productive soil.<sup>7</sup> The cultural landscape of the area reflects the prosperity the inhabitants have enjoyed since the early development of this section of the country.

#### Climate

Many minor variations characterize the topography of Maury County, but none of them are sufficiently great to alter the climate significantly. The Rim area rises 950 to 1,000 feet above sea level while the Basin has an elevation of 500 to 650 feet.<sup>8</sup>

Blair classified the climate of the county as a Warm Humid Continental climate (ICw).<sup>9</sup> Maury County lies within a climatic transition zone and is affected by both the Humid Continental, "warm subtype" (ICw), and the Humid Subtropical climate (STH) that exists over the area south of the county. The milder features of the two climates are combined in this area.

Tennessee, hence Maury County, does not lie directly within any of the storm tracts that cross the country but comes under the influence of the storm centers that pass along the Gulf Coast and up the Atlantic seaboard, and also those that pass from Oklahoma northeastward to the Great Lakes and the coast of Maine.<sup>10</sup> Weather changes are frequent, but great and sudden changes are rare. The winters are mild and short, except for an occasional

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<sup>7</sup>United States Geological Survey, Water Supply Paper, op. cit., p. 14.

<sup>8</sup>United States Department of Agriculture, Soil Survey, Maury County (1923), p. 153.

<sup>9</sup>Thomas A. Blair, Climatology (1942), p. 149.

<sup>10</sup>United States Department of Agriculture, Climate and Man (1941), p. 1128.

severe "norther" that lasts only a few days. The mean winter temperature (December, January, and February) for Maury County is 40.4° F. with extremes of -13° and 79° F.<sup>11</sup> In most years snow covers the ground for only a few days during the winter season. Summers are long but not oppressively hot. The mean temperature for the summer months (June, July, and August) is 71.1° F., the absolute extremes being 42° and 108° F. The mean annual temperature for the county is 59.3° F. Fairly uniform conditions prevail over the county as there are no major physiographic features to cause local variations in the climate. However, the growing season of the Rim area is slightly shorter than in the Central Basin.<sup>12</sup>

Two great systems of wind prevail over the county.<sup>13</sup> One system consists of currents flowing to the north and northeast. These are the warm, moist, southern surface winds from the Gulf of Mexico. The other system consists of northwest and north winds. They are dry and cool. The prevailing winds of the area are from the south-southwest or from the north-northwest, depending on which system is dominant, while winds from the east and northeast are due to abnormal influences.

The average annual precipitation of the county totals 49.94 inches according to data of the Ashwood Weather station situated five miles south-southwest of Columbia, Tennessee, and based on records covering a period of fifty-seven years.<sup>14</sup> During this period, the total amount of rainfall for

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<sup>11</sup>United States Department of Agriculture, Soil Survey, Maury County (1923), p. 155.

<sup>12</sup>Tennessee State Planning Commission, Industrial Resources of Tennessee, (1948), p. 49.

<sup>13</sup>James M. Safford, Geology of Tennessee (1889), p. 17.

<sup>14</sup>United States Department of Agriculture, Weather Bureau, Climatic Summary, Western Tennessee, Section 76 (1930), p. 9.



the driest year (1901) was 32.42 inches and that for the wettest year (1880) reached 62.10 inches. The rainfall is well distributed throughout the winter, spring, and early summer months when it is most needed for growing crops. The period of lightest rainfall comes during September, October and November at the time of greatest harvesting activities.

Robert De C. Ward identifies the rainfall of this area as the "Tennessee Type," with a single maximum in March and a well-marked minimum in October. The March maximum results from the passing of the warm damp southerly winds of the cyclonic storms which cross Tennessee in the late winter and early spring on their way north from Texas and the Gulf. The October minimum is due to the relatively inactive storm centers during this season of the year.<sup>15</sup>

A more detailed study in the distribution of rainfall may be found from a study of the temperature and precipitation chart (Figure 2).

The average frost-free periods extend from April 9th to October 21st. The average length of growing season is 195 days.<sup>16</sup> Killing frosts have occurred as late in the spring as April 24th and as early in the fall as October 8th.<sup>17</sup> The average number of clear days per year in Tennessee is 156, while 99 are partly cloudy and 110 days are cloudy.<sup>18</sup>

A broad diversified system of agriculture has been developed in the county. The abundant rainfall of the region insures a sufficient water supply, which is of great value to the important stock-raising industry, as well as

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<sup>15</sup>Robert De C. Ward and Charles F. Brooks, The Climates of North America (1936), p. 1143.

<sup>16</sup>United States Department of Agriculture, Weather Bureau, op. cit., p. 1120.

<sup>17</sup>United States Department of Agriculture, Soil Survey, Maury County (1923), p. 156.

<sup>18</sup>United States Department of Commerce, Weather Bureau, Climatology Data, Tennessee Section (1947), p. 51.

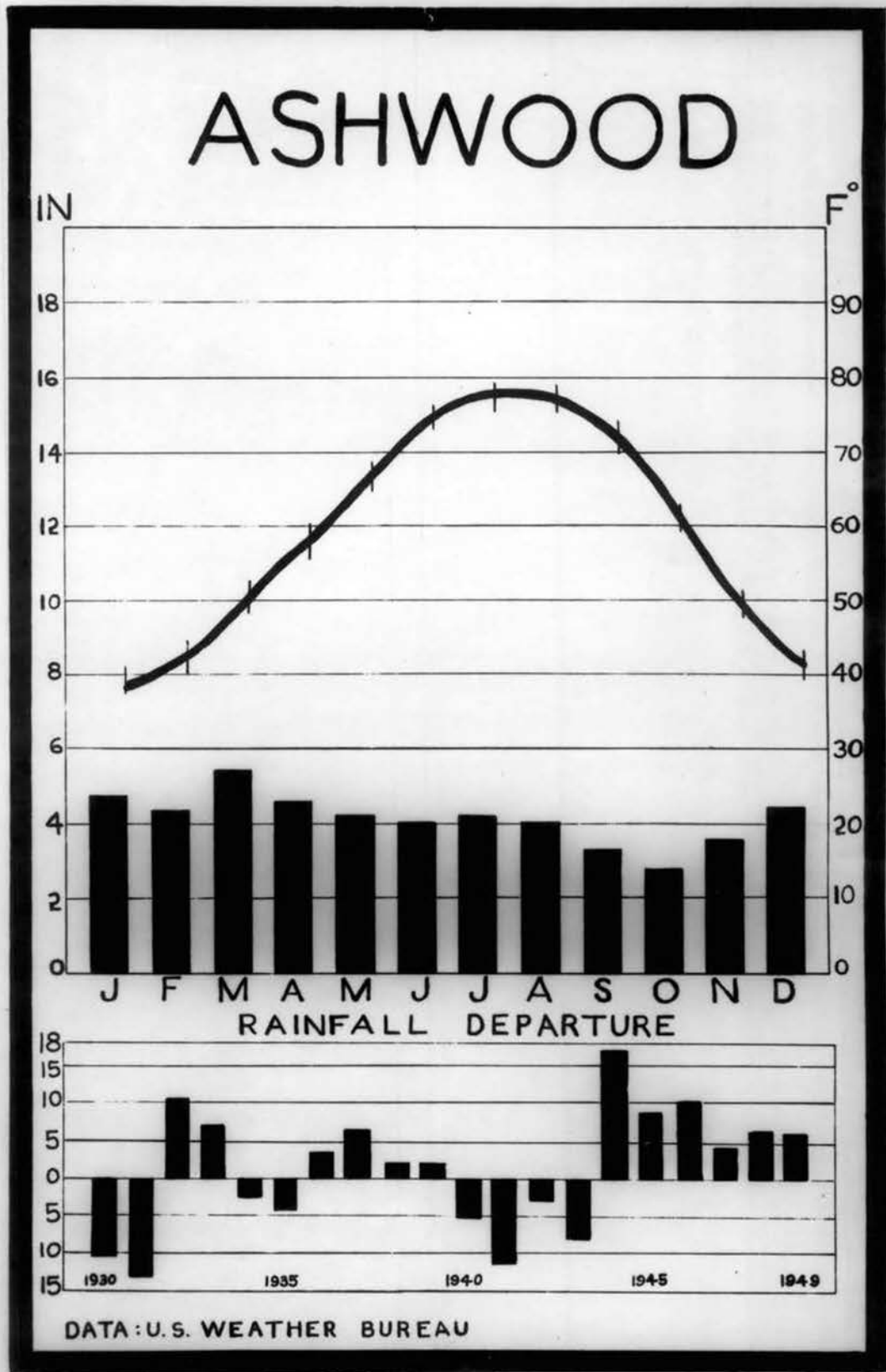


FIG. 2

to the crops and pasture. Occasional droughts do occur, lasting from fifteen to thirty days. They come mostly in late summer and autumn and are most harmful to pastures and fall planting. Climatic conditions permit farming operations throughout the year, except for short periods during the winter. The humid climate of the region favors erosion and encourages leaching of the soil, both of which in turn affect productivity.

#### Drainage

Duck river, the master stream of Maury County, flows northwestward through the middle part of the county and drains the entire area. On the eastern side of the county, the river follows a tortuous course of about seventeen miles between points of only three miles apart. The meanders are of great amplitude and flow near the center of the valley. Very little meandering of the river occurs on its flood plain. High terrace gravel deposits exist along Duck River in the western part of the county between Williamsport and Kettle Mills.

The degree of dissection within the basin is characteristic of old age topography upon which streams have had time to extend and adjust themselves until they drain all parts of the county in a most efficient manner. In no section are distinct drainage lines further apart than about a quarter of a mile.<sup>19</sup>

In the northwestern part of the county, narrow flats appear on the divides between Lopers, Snow, and Lick creeks. The Old Natchez trace following one of these divides for several miles illustrates early adjustment to topographic conditions. The tributaries of Duck River run in synclinal

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<sup>19</sup>United States Geological Survey, op. cit., p. 12.

troughs in both the Basin and Rim areas. On the whole the county is well drained. Nearly all of the streams have cut deep channels and are consequently bordered by lands seldom inundated.

#### Edaphic Resources

C. F. Marbut, soil scientist, classifies the soils of Maury County as pedalfers and further identifies these soils as "gray-brown-podzolic soils." Pedalfer soils are formed in regions of heavy to moderate rainfall. Alternate freezing and thawing of the ground during winter months, along with an average annual precipitation of 49.94 inches, have favored leaching and erosion of soils in this section of the country.

Maury County possesses three important soil associations which correlate closely with the physiographic divisions--the county is partly in the Nashville Basin and partly in the Highland Rim section described previously. The Inner Basin and Outer Basin are subdivisions of the Nashville Basin (Figure 3).

The Inner Basin is a nearly level plain characterized by shallow soils and a very high proportion of "glady" rockland. The soils are derived from weathered materials of level-bedded, clayey, low phosphatic limestone. The more extensive soils of the uplands have brown surface soils and yellowish-red or reddish-yellow very plastic silty clay subsoils. These soils, only moderately well supplied with the major mineral plant nutrients, find it difficult to maintain good tilth, thus become too drouthy for most crops. Hagerstown, Talbott, Huntington, and Lindside are the more important soil series.<sup>20</sup>

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<sup>20</sup>Lester Odum of United States Soil Survey, Special Report on Soils of Maury County (Unpublished). (January 4, 1950), pp. 1-3.

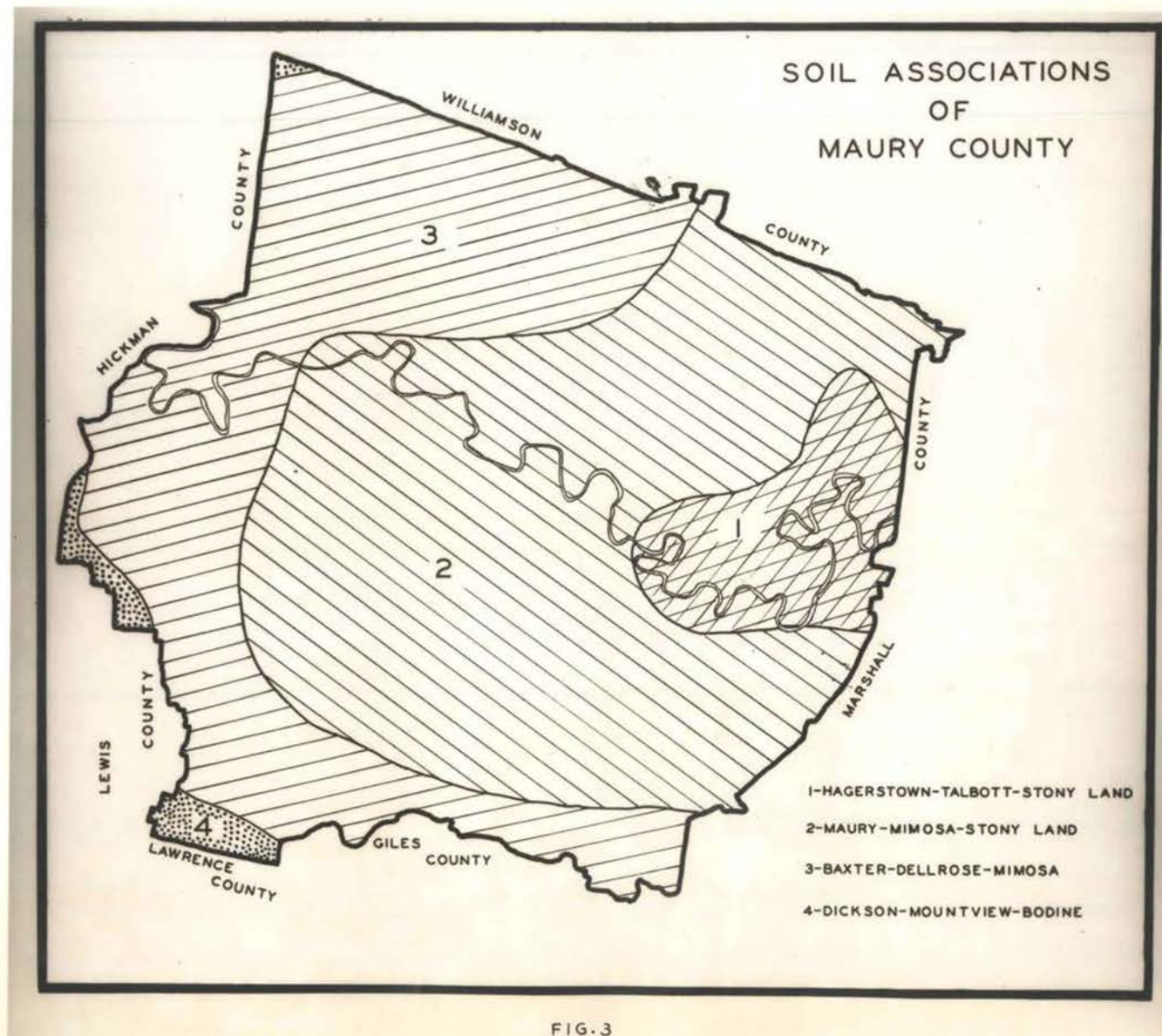


FIG. 3

The Outer Basin has an undulating to strongly rolling topography with many high knob-like hills, remnants of the Highland Rim, which correlate with the Maury-Mimosa-Stony land soil associations.<sup>21</sup> The soils in this area, derived from materials weathered from phosphatic limestones, contain an ample supply of phosphorus. A majority of the soils have dark-brown surface soils and strong-brown subsoils. The chief differences between the soils lie in the depth to bedrock and the character of the subsoils; they vary from friable to very plastic in consistence. Maury, McAfee, Mimosa, Godwin, and Huntington constitute the most extensive series. This area contains some of the most fertile soils in the eastern United States, and given adequate moisture, they become very productive of a wide variety of crops.

The Highland Rim section of the county, which includes parts of Baxter-Dellrose-Mimosa and the Dickson-Mountview-Bodine soil associations, is predominantly hilly and steep, although it includes a small part of the smoother plateau. Most of the soils are derived from materials weathered from very cherty limestone, but some on the smoother ridgetops are from wind-blown silt (loess).<sup>22</sup> Surface soils, predominantly light colored, overlie subsoils with colors ranging from brownish yellow to yellowish red. Practically all of the soils have friable subsoils.<sup>23</sup> Bodine, Baxter, Mountview, Dellrose and Dickson make up the most extensive soil series. Compared with the soils of the Basin, these soils are low to very low in fertility. Owing to chertiness and steep slopes, many are difficult to farm and conservation programs are likewise difficult to practice.

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<sup>21</sup>Ibid., p. 2.

<sup>22</sup>Ibid., p. 3.

<sup>23</sup>United States Department of Agriculture, Soil Survey, Maury County (1923), p. 162.

Work progresses on a detailed soil survey for Maury County this year (1950), cooperatively among the United States Department of Agriculture, the Tennessee Experiment Station, and the Tennessee Valley Authority. Lester E. Odum serves as Soil Inspector for the survey.

#### Natural Vegetation

Maury County lies within the area that once was occupied by the great eastern forest. The entire area was covered by a mixed growth of hardwood trees classified as the oak-chestnut-yellow poplar type of forest.<sup>24</sup>

Settled by people seeking fertile soil, the forest soon gave way to cultivated crops. The rich limestone phosphatic soils encouraged luxuriant growth of native blue grass ideally suited for grazing purposes.

The lumber industry has removed the better timber. The important commercial hardwoods at the present time include red oak, white oak, yellow poplar, hickory, beech, black gum, and maple. Between 20 and 29 per cent of the county's total acreage is now devoted to forest.<sup>25</sup>

Environmental factors prevailing in Maury County, including climate, relief features, drainage, and edaphic resources are generally favorable for man and his activities.

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<sup>24</sup>C. Langdon White and Edwin J. Foscoe, Regional Geography of Anglo-America, (1943), p. 336.

<sup>25</sup>Tennessee State Planning Commission, Data, Tennessee State Division of Forestry (1946), p. 6.

## CHAPTER III

## CULTURAL DEVELOPMENT

A full geographic expression of an area requires an understanding of the cultural background, including the origin and characteristics of its people and their influence on the development of the land. Maury County, originally the hunting ground of the Cherokee Indian, was settled by people moving in from the East who had heard this area was a part of a very fertile valley. After the removal of the Indians, small farm centers and communities were established. Houses of many types were built, from the simple log cabins to mansions with stately columns and many fireplaces with imported marble mantels.

The people were hospitable by nature and delighted in entertaining with dinners and socials; many distinguished visitors and statesmen were entertained in this manner. Schools and churches were built and traditions were established which continue their influence on the people today. The late John Trotwood Moore, a noted Tennessee writer, referred to Maury County as "The Dimple of the Universe." The inhabitants feel that this is a fitting and appropriate name.

Transportation

Transportation modes in Maury County have progressed from carts pulled by oxen to the most modern of motor cars, and from the canoes to the flat bottom river boats. Lacking physical barriers, this county has become the possessor of many highways which makes it easily accessible for trade, for local travel, and for through routes for tourists. The accessible transportation for man and his possessions, and the development of routes and carriers



for the exchange of goods have influenced the economic and cultural progress of Maury County.

Early Trails.--The early settlers and explorers of Maury County arrived mostly on horseback or on foot following the main Indian trails through the wilderness. Several of the trails traversing Maury County later became roads used by ox carts and horse-drawn carriages.

Two of the most widely used of the old Maury County roads were the Natchez Trace, which skirts the county in the extreme northwest and crosses Duck River at Shady Grove, and the Old Davis Ford Road which passed through the center of the county leading from Nashville to Huntsville, Alabama.<sup>1</sup>

The Natchez Trace led to Natchez, Mississippi, and was the route taken by all land travelers to and from New Orleans in the early days.

The Old Davis Ford Road came down in the general direction of Spring Hill and veered east from Columbia to cross Duck River at Davis Ford, a short distance below the mouth of Fountain Creek. It passed through the present location of Glendale and Culleoka, and over Elk Ridge into Giles County at Dodson's Gap through which the railroads were later constructed leading to the south.<sup>2</sup>

River Crossings.--In the early days, as many as six ferry boats regularly plied Duck River in Maury County. Holland's Ferry crossed Duck River above Fountain Creek. Bear Creek Ferry operated at the mouth of Bear Creek. The Columbia Ferry crossed Duck River at Columbia, Williams Ferry was on the road leading from Columbia by Williamsport to Shady Grove, and Gordon's Ferry

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<sup>1</sup>Tennessee State Highway Department, Special Report on Transportation of Maury County (Jan., 1950), p. 1.

<sup>2</sup>Daily Herald, Columbia, Tennessee, (October 3, 1948), p. 4.

was the river crossing for those traveling the Natchez Trace.<sup>3</sup>

Several unsuccessful attempts were made to establish navigation on Duck River. However, quite a lot of transport was handled by flatboats, the first operating out of Williamsport in the western section of the county.

Railroads.--The most important date in the history of transportation came late in 1759 when trains of the Louisville and Nashville Railroad entered Columbia from the north and were soon running complete schedules to Decatur, Alabama, and other points in the South.

Soon after the completion of the main line, which served Spring Hill, Carters Creek, Darks Mill, Godwin, Columbia, Glendale, Culleoka and Campbells Station, a branch line to Mt. Pleasant was built. Except for a period during the Civil War, these lines have been in continuous daily operation in the county.

Maury County has been a steady and reliable customer of the railroad, furnishing both passengers and freight, but especially freight in recent years, due to the growth and expansion of the phosphate industry in the county.

Improved Roads.--Later, an extensive system of turnpikes was built and maintained by private companies as toll roads. The companies recovered their investment and made a profit by charging a toll for each vehicle and animal using the road. At the turn of the twentieth century, the privately owned turnpikes gave way to the present system of county roads and state highways. The local or state governments in most cases purchased the roads from the owners.

Today, Maury County has 118 miles of state highways including thirty-two

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<sup>3</sup>Mrs. Ruel Sellers, (Unpublished) Private Papers.

miles of roads in the interstate system. All of these roads are surfaced with bituminous or concrete. The county system comprises 928 miles maintained by the County Highway Department. Of this total, five miles are bituminous surfaced roads, 875 miles are gravel or crushed stone and 48 miles are unimproved.<sup>4</sup> No commercial airline terminals are located within the county.

On the whole the transportation system of Maury County has been of a progressive nature. Certainly much progress has been made from the time in 1849 when twelve hours were required to make a stage coach trip to Nashville, or when the farmer had to figure on a trip of three to seven days to deliver a wagon load of produce to the Nashville markets.

#### Population Characteristics

National Origin of the Peoples.--Early settlers came to Maury County mostly from North Carolina, South Carolina, and Virginia. Predominate ethnic groups represented in the colonial population of Virginia and the Carolinas were Scotch-Irish and English, and it is from these groups that the pioneers of Maury County were drawn. Many of the early settlers consisted of persons who had received large tracts of land from North Carolina for services in the Revolutionary War.

Before 1770, all the present Tennessee area was still Cherokee Indian territory. The occupancy of these lands followed the prevailing American pattern. Squatters and speculators entered the Indian Territory and developed friction with the Indians and then set about to expel or destroy them.

The Indians were mostly cleared from Maury County in 1806 by purchase of the lands of "Old Black Fox," a Cherokee Indian Chief.<sup>5</sup> This encouraged more

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<sup>4</sup>Tennessee State Highway Department, loc. cit.

<sup>5</sup>Daily Herald, op. cit., p. 7.

settlers to move in. The early settlements usually located around a ferry, a grist mill, or a store.

Origin of Maury County.--The county of Maury was organized under an act of the General Assembly passed November 16, 1807, at Knoxville, Tennessee, entitled, "An Act to Reduce Williamson County to Its Constitutional Limits."<sup>6</sup>

Maury County originally took in all of Giles County, most of Lewis and Marshall counties, and portions of Bedford, Hickman and Lawrence counties.<sup>7</sup>

The county was named after Major Abram P. Maury, a distinguished son of Williamson County who was a member of the Tennessee State Legislature.

Early Settlements.--The settlements of Bigbyville, at the head of Bigby Creek, and Lanton, which had its origin from a grist mill operated by Solomon Bunch, started before the Indian titles were cleared. A ferry operated across Duck River at Williamsport as early as 1806. This river port was probably one of the earliest settlements in the county since early settlers found their way here by canoes up Duck River from the Tennessee River.<sup>8</sup>

Twenty families from the Williamsburg District in South Carolina purchased five thousand acres from the General Greene Survey in 1807 and settled the Zion Community in the heart of the county.<sup>9</sup> A Presbyterian Church was erected there in the same year. Descendants of these settlers still live in the little community and at death are buried in the church cemetery beside their ancestors.

Colonel William Polk acquired five thousand acres and settled the St. John's Community in 1807. The historic St. John's Episcopal Church was

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<sup>6</sup>William S. Fleming, A Historical Sketch of Maury County (1909), p. 1.

<sup>7</sup>Ibid., p. 3.

<sup>8</sup>Mrs. Ruel Sellers, Early Settlements in Maury County (Unpublished report), p. 1.

<sup>9</sup>Federal Writers Project, Tennessee (1939), p. 589.

erected in 1845 in this neighborhood through the influence of the Polk family.

Both Zion and St. John's communities were settled by a pioneer stock of culture and refinement on some of the most productive land in the county.

Some of the best examples of ante-bellum Greek Revival Architecture are to be found in these two communities a few miles south of Columbia. Among these are the three Pillow homes, Clifton Place, Bethel Place, and Halliday Place. The three Polk homes--Hamilton Place, Ashwood Hall, and Rattle and Snap--were built by sons of William Polk. Rattle and Snap, the last of the Polk houses, was completed in 1845 and is an unusual structure, with ten magnificent Corinthian columns extending the full height of the spacious two-story front. The portico which extends across the entire front is projected forward and pedimented. The columns were brought by boat from Cincinnati, Ohio, and then hauled by ox carts from Nashville to the site.<sup>10</sup> Most of the families in these communities owned slaves and practiced plantation farming in a moderate manner.

Major George Daugherty, a Revolutionary soldier from North Carolina, was allotted a five thousand acre tract of land about eight miles north of Columbia. His widow and daughter settled on this land in 1808. William Cathey of Salisbury, North Carolina, received a grant of five thousand acres in the western part of the county and started a settlement on Cathey's Creek around 1810. A small tract of the grant is still in the possession of the family and today is cultivated by the fourth generation. There were many more farmers in the county who either bought land or received small grants from the state of Tennessee. They owned no slaves and lived in log cabins and

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<sup>10</sup>Rattle and Snap got its name from a dice game in which the land on which it stands was won from the Governor of North Carolina.

"breezeway" houses.

Present Population.--The present white population of the county is composed largely of the descendants of these early settlers, while the colored population is comprised mainly of the descendants of the liberated slaves. The sixteenth United States Census, 1940, reports a total county population of 40,357; 74.8 per cent native white, 25.1 per cent colored, and 0.1 per cent foreign born (Table 1).

TABLE 1

RACIAL CHARACTERISTICS OF MAURY COUNTY POPULATION IN 1940<sup>11</sup>

	Maury County		Columbia		Mt. Pleasant	
	Number	Per Cent	Number	Per Cent	Number	Per Cent
White	30,227	74.9	7,643	72.2	2,140	68.9
Colored	10,130	25.1	2,936	27.8	949	31.1
Total	40,357	100.0	10,579	100.0	3,089	100.0

<sup>11</sup>Sixteenth United States Census, (1940).

Educational Attainment.--The median school year completed in Maury County is 7.4 years. Of the adults 77.5 per cent have completed five or more years of school, while 17.2 per cent have completed high school.<sup>11</sup> A predominately rural population and a high percentage of colored people lower the county's educational attainment. Maury County advocates consolidation of its rural schools when practical; as a result very few one- and two-teacher schools remain in the county. Maury County maintains six senior high schools, two junior high schools, thirty-three elementary schools for white children, two senior high schools and twenty-four elementary schools

<sup>11</sup>United States Department of Commerce, County Data Book (1947), p. 348.

for colored children. In 1948, the total enrollment in white high schools was 1,129 and 320 were attending colored high schools; there was a total enrollment of 5,102 white and 1581 negroes.

Income.--In an unpublished report, the Tennessee Valley Authority shows the median family income by counties for the state.<sup>12</sup> Four levels of family income were determined and used in classifying the counties; the first level included counties with a median family income exceeding \$1050; the second level included those counties with a median family income between \$800 and \$1049; the third level ranged between \$650 and \$799; and the fourth level grouped those counties with median family income below \$650.

Only four counties in the state attained the peak level with a median family income of more than \$1050 per annum. Maury County was one of fifteen counties in the state to fall in the second level with a median family income of \$800-\$1049 per year. This leaves 76 counties in the state with median family income below that of Maury County.

Standard of Living.--In Maury County there are strong contrasts in wealth, culture, politics and even religion between the people living on the small farms of the hilly uplands of the Highland Rim and the thin glady soils of the Inner Basin and the well-to-do farmers of the Outer Basin who receive a good income from larger farms and more fertile lands. The people of the Outer Basin maintain a higher standard of living than those of the Inner Basin and the Highland Rim areas of the county. More substantial houses, better equipped farms, more automobiles, and other conveniences of life are found in the Outer Basin where agricultural productivity is greatest. The

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<sup>12</sup>The TVA study includes both money income and real income in terms of services, crops harvested and similar sources of livelihood.

cultural landscape reflects these differences among the three sections of Maury County.

Health.--Climate and other environmental factors of Maury County are generally favorable to health and human occupation; however, the county has health problems of disease and malnutrition. The Second World War revealed the poor physical condition of many of the men in the county who were examined for service. More than 35.2 per cent of those examined were rejected principally for reasons of health.<sup>13</sup>

Tuberculosis accounts for a number of deaths in the county annually. Many of the colored people contract the disease while working in the dusty atmosphere of the mining industries. Since 1917, tuberculosis has dropped from first place among causes of death to seventh place. The rate of both the county and state are still much higher than that of the nation. The higher tubercular mortality rate among the negroes of Maury County reflects the difference in social and economic conditions rather than a racial difference in susceptibility to the disease. Heart disease takes the heaviest toll of human life in the area, cancer is second, and vascular lesions are the third greatest cause of death in the county.<sup>14</sup>

Maury County has twenty-one doctors of medicine and two hospitals which are located in Columbia. The Kings Daughters Hospital has seventy-five beds while the Maury County Hospital is equipped with only ten beds and serves the colored people in the area. These hospital facilities, although inadequate, are above average for many rural areas.

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<sup>13</sup>John Ballanger Knox, The People of Tennessee (1949), p. 105.

<sup>14</sup>Tennessee Department of Health, Tennessee Summary of Vital Statistics, (1945), V. 26, p. 117.



Population Trends

Population growth in Maury County has been slow. The county's population has increased but little in the last half century; the urban centers of Columbia and Mt. Pleasant have enjoyed most of the growth.

Population trends in Maury County and Columbia in the past fifty years are shown in Table 2.

TABLE 2

POPULATION TRENDS OF MAURY COUNTY\*

Year	Maury County	Per Cent Increase	Columbia	Per Cent Increase
1890	38,112		5,379	
1900	42,703	12.4	6,052	12.7
1910	40,456	- 5.2	5,754	- 4.9
1920	35,403	-13.0	5,526	- 4.0
1930	34,016	- 3.9	7,882	42.6
1940	40,357	18.6	10,579	34.2

\*United States Census for selected years.

Since 1890, when the county's population was 13 per cent urban and 87 per cent rural, a shift from rural to urban has continued until the corresponding percentages in 1940 were 33.5 per cent urban and 65.5 per cent rural.

During the census decade from 1930 to 1940, urban population in the county increased 73.4 per cent while rural population increased only 2.1 per cent. The total county's population increased during this same period 18.6 per cent. Columbia and Mt. Pleasant are the only towns that qualify as urban centers of population.<sup>15</sup> Columbia had a population of 10,579 and Mt. Pleasant

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<sup>15</sup>United States Census requires 2500 for a town to be classed as an urban center.

3,089 in 1940, according to the United States Census.

The varied topographic and edaphic conditions of the county are reflected in the variable density of Maury County's population. The more sparsely populated areas are located in the Inner Basin and on portions of the Highland Rim area where the soils are less productive. The more densely populated Outer Basin indicates that topography and soils are better adapted to agriculture and industrial development. The average density of population in the county in 1940 was 65.7 people per square mile. Davidson County is the only county in the Nashville Basin with a greater density. Both of the urban population centers of the county are located in the Outer Basin.

In a period of fifty years, Maury County has changed from a strictly rural area to an area with a more nearly balanced economy between agriculture and industry. Urban growth tends to reflect industrial development and other favorable economic conditions in the county. The decrease in rural population can be attributed to farm mechanization and industrial development in the county.

#### Geographic Influence on Population Centers

While Maury County has only two cities with a population over 2,500, there are a number of small population centers located within the county. None of these centers have experienced any phenomenal growth. The towns are located in response to various factors, river transportation, agricultural conditions, mineral deposits, and railroad service.

Columbia.--Columbia, the county seat, situated in the center of a rich agricultural area, forty-three miles south of Nashville, occupies a favorable location for trade and, in the early days, functioned primarily as a collecting and distributing center for farm products. Columbia gained its wealth from

fine livestock and diversified farming until the discovery of phosphate in the area at the close of the last century.

In addition to large chemical operations resulting from phosphate production, the city now has a diversity of industry including the manufacture of hosiery, carbon electrodes, chairs and work clothing. There are also processing plants for agricultural produce including grain, dairy and meat products, and those preparing stock feeds and fertilizers.

The city is served by the main line of the Louisville and Nashville Railroad and by a number of hard-surfaced roads including the Andrew Jackson Highway and United States Route No. 31 leading to points in the South. State Highway 50 and Highway 99 connect Columbia with Chattanooga and Memphis. These transportation routes focusing into Columbia expanded the retail and wholesale trade beyond the limits of the county. A branch line of the Louisville and Nashville Railroad leads from Columbia to the phosphate and forest resources in the southwest on the Highland Rim.

Columbia was founded in 1807. Many beautiful old homes and places of historical interest exist in the city. Among the places that attract tourists are: the ancestral home of James K. Polk, eleventh president of the United States; the Edward (Pop) Geers Memorial Park, dedicated to the "Grand Old Man" of the turf; the Columbia Institute Building, a replica of an English castle; and the Columbia Military Academy established by the United States Government.

Mt. Pleasant.--Mt. Pleasant, the only other urban population center, is situated in the southwestern part of the county and owes its growth chiefly to the phosphate resources in the adjoining areas. Its population (3,069 in 1940) is primarily engaged in the mining of phosphates or in industries associated with processing or utilizing this resource. Labor requirements of these industries are reflected by the high percentage of Negroes among the

total population (Table I).

The town is served by a branch line of the Louisville and Nashville Railroad and by the Federal Highway No. 31 leading to Birmingham and other points in the South. Mt. Pleasant is a financial and trading center for the surrounding farm community which extends into the interior of the Outer Basin.

Other Population Centers.--The other centers of Maury County include Spring Hill, Hampshire, Culleoka and Santa Fe. Spring Hill is surrounded by choice farm land at the northern edge of the county. It is served by the Louisville and Nashville Railroad and Highway No. 31. Its central location between Columbia and Franklin hampered its chance for population growth or industrial development.

Hampshire, a small town in the western part of the county, has changed very little in the past fifty years. It is one of the few rural communities in Tennessee where banking facilities remain. The citizens boast of a refrigerator locker and a community cannery which are busy places during the summer and fall months.

Culleoka, located in southeastern Maury County, has enjoyed favorable transportation facilities but has been handicapped by unproductive soil and limited resources. The population has remained rather static through the years. The community is famous for its early schools and has produced many capable leaders who have rendered valuable services to their county and state.

Santa Fe, situated on the periphery of the Highland Rim Plateau in the northwestern part of the county, was one of the earliest settlements. The surrounding topography made early road building difficult, however today the citizens enjoy transportation facilities comparable to those of other sections of the county.

## CHAPTER IV

## AGRICULTURE

Owing to its highly diversified character, farming in Maury County is markedly stable throughout good and bad times. Both the farm population and the size of the farms reflect this stability as neither has varied much in the last twenty-five years. In 1920, the average Maury County farm had 94.1 acres, in 1940 the average size was 94.4 acres and by 1945 it had reached 100.3 acres.<sup>1</sup> Approximately one-half of the county's farms have less than fifty acres, one-fifth of them range from fifty to one hundred acres and only six have more than a thousand acres. While most of the county farms comprise small acreages, 57.2 per cent are owner operated.<sup>2</sup>

The farm population remained fairly stationary between 1920 and 1940 and dropped from 18,014 in 1940 to 14,560 in 1945.<sup>3</sup> The trend toward farm mechanization and the general farm to city migration, resulting from the industrial development of war industries, largely account for the decrease in farm population during the five year interval. Also a large number of young men were serving in the armed forces on the latter date.

Wherever land is used primarily for agricultural purposes, as in Maury County, man adjusts himself to his natural environment of climatic, edaphic and topographic conditions. All of these environmental factors have previously been discussed in Chapter II. An attempt will be made to interpret the adjustment and progress that has taken place in the agricultural pattern of the

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<sup>1</sup>United States Department of Commerce, United States Bureau of Census (1920), (1940), (1945).

<sup>2</sup>United States Department of Commerce, Agriculture Census (1945).

<sup>3</sup>Ibid., Agriculture Census (1945).

county in relation to its natural setting. The traditional pattern of farming originally consisted of "mining" the soil with the typical frontier row crops. As the soil was depleted, the farmers sought new lands locally or further west. During the past fifty years, a shift from row crops to soil building and soil conserving grass crops has occurred and is now returning dividends to its people. This pattern of farming is reflected in Table 5, page 34, which shows a decrease in acreage of corn and other row crops and an increase in pasture grasses and legumes. By trial and error, man found the crops best suited to the local environment and in a general way worked out a system of farming better adapted to the natural milieu.

TABLE 3

## LAND USE IN MAURY COUNTY\*

Classification	Acres--1940	Acres--1945
Total Land in Farms . . . . .	341,795	557,405
Crop Land Harvested . . . . .	126,009	136,356
Crop Land Failures . . . . .	1,705	943
Crop Land Idle or Fallow . . . . .	13,458	10,788
Total Pasture Land . . . . .	98,187	174,743
Total Woods Land . . . . .	67,442	45,273
All Other Land . . . . .	---	15,036

\*United States Department of Commerce, Bureau of Census, 1940 and 1945.

The increase in total pasture land from 1940 to 1945 coincides with urban migration and the increased demand for dairy products brought about by the growing urban population.

Farm Crops

O. E. Baker locates Maury County in the corn and winter wheat

belt.<sup>4</sup> Although climatic and edaphic conditions are adapted to many kinds of crops, the chief ones are tobacco, hay, corn, winter wheat, and other small grains. The extensive type of farming practiced in the county emphasizes the production of feed for livestock. Tobacco, the chief money crop, is the only intensively cultivated crop. It occupies only about three per cent of the cropland, which is much less than that devoted to corn and livestock production.

Corn.--From the standpoint of acreage and general popularity, corn is and always has been the number one crop in Maury County. It nurtured the pioneers through their early years of hardship and adaptation. Its adaptability, ease of planting and harvesting, and popularity as human food and livestock feed have served to maintain its prominence in the general farming program of the county. But as in many other places, this cereal, while building up the muscles and tissues of the human body, has torn down the structure of the soil. Corn is therefore the number one destroyer of Maury County's most fundamental and essential resource, the soil.

The acreage planted to corn in Maury County decreased from 80,611 acres in 1900 to 46,413 acres in 1945. This is a 42 per cent decrease in total acreage planted to corn in a period of forty-five years. Corn is raised mainly for stock feed; cash corn farms are few. In 1945, corn occupied 34 per cent of the cultivated acreage of the county with an average yield of 18.5 bushels per acre (Table 4). The production, valued at \$1,243,976, ranked next to tobacco in value. Of the ten leading Tennessee counties in production of corn, Maury County ranks tenth. Corn is the State's leading crop in both

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<sup>4</sup>O. E. Baker, "Agricultural Regions of North America," Economic Geography, Vol. 3 (1937), pp. 309-39.

acreage and value.<sup>5</sup>

TABLE 4

ACREAGE AND PERCENTAGE OF CULTIVATED LAND FOR THE COUNTY'S SIX MAJOR CROPS<sup>6</sup>

Crop	Acres	Per Cent of Land Cultivated
Corn . . . . .	46,613	34.0
Hay . . . . .	43,182	31.0
Wheat . . . . .	16,452	12.0
Barley . . . . .	10,644	7.4
Oats . . . . .	5,999	4.4
Tobacco . . . . .	4,175	3.0
Total	127,065	91.8

<sup>6</sup>United States Department of Commerce, Agricultural Census (1945).

Hay.--Hay is one of the leading crops in Maury County. It is the second crop in acreage, outranked only by corn. In value of production it stands third, exceeded by tobacco and corn. Lespedeza is by far the leading kind of hay raised in the county, accounting for about 65 per cent of the total hay acreage in 1945. Other important hay crops are alfalfa, clover and timothy. Less important kinds include small grains cut green for hay.

Alfalfa acreage has increased steadily in the past twenty-five years while timothy and clover acreage has decreased. Maury County ranks fourth in hay production among the counties of the state. The agricultural census of 1945 reports 8,211 acres of alfalfa hay, 34,178 acres of other legumes and grass hay, 793 acres of oats hay, and a total hay acreage of 43,182 acres.

<sup>5</sup>Tennessee State Planning Commission, Industrial Resources (1948), p. 29.



The scarcity of farm labor and an increasing demand for dairy products account largely for the increased acreage of the hay crops. The hay acreage increased from 27,213 acres in 1930 to 43,182 acres in 1945 (Table 5). This represents a 42 per cent increase in a period of fifteen years and reflects the trend from row crops to pasture crops and dairy farming.

Winter Wheat.--Considerable wheat has been grown in Tennessee since pioneer days. Before the tide of immigrants to the northern interior of the country, particularly to the Trans-Mississippian area, wheat prices ranged fairly high in Tennessee and the state ranked among the foremost producers of wheat.<sup>6</sup> Since the Civil War, wheat has been produced more economically on the Great Plains than in Tennessee; consequently, wheat growing has declined in importance in the state and in Maury County. However, high prices during the two world wars stimulated wheat production in the county during the war years and immediately following.

Wheat serves several purposes; it is a good cover and pasture crop in winter; however, it cannot be sown as early in the fall as desirable because of the Hessian Fly. It serves as a nurse crop for other grasses and legumes and is a minor money crop in the county. Wheat fits well in the rotation pattern and its seasonal labor demands enables the farmer to distribute his work among other activities during the idle seasons.

Wheat was planted on 16,456 acres in 1945 and averaged 15.6 bushels per acre.<sup>7</sup> The value of the crop in the same year was \$400,904.

Barley.--Maury County's barley acreage remained fairly steady from 1880 to 1935 (Table 5). Since that time the acreage showed a consistent

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<sup>6</sup>Philip Hamer, Tennessee, A History, Volume II (1938), pp. 851-852.

<sup>7</sup>United States Department of Commerce, Agriculture Census (1945).

TABLE 5

## ACREAGE AND YIELD OF MAJOR CROPS PRODUCED IN MAURY COUNTY\*

Crop	Year							
	1890	1900	1910	1920	1930	1936	1940	1945
1 Corn--acres	85,496	85,611	74,698	81,918	63,339	56,751	51,777	46,613
Total Bushels	2,363,414	1,577,460	1,953,996	2,159,421	1,629,125	1,307,296	1,082,305	861,336
Bushels per acre	19.1	19.6	26.2	26.4	25.7	24.8	20.9	18.5
2 Wheat--acres	26,711	54,843	32,189	23,758	17,807	16,766	9,747	16,452
Total Bushels	346,718	630,660	497,653	245,395	127,574	197,136	116,432	256,990
Bushels per acre	13.0	11.5	15.5	10.3	7.2	11.8	11.9	15.6
3 Barley--acres	214	110	205	268	75	1,459	2,058	10,644
Total Bushels	4,836	1,860	4,416	7,027	1,280	21,803	36,645	216,474
Bushels per acre	22.6	18.6	21.6	26.6	17.1	14.9	17.8	20.3
4 Oats--acres	14,642	7,644	18,092	10,453	2,217	2,674	3,136	5,999
Total Bushels	279,068	124,020	300,120	198,395	37,129	49,924	50,840	159,733
Bushels per acre	19.1	16.2	16.6	19.0	16.7	18.7	16.0	26.6
5 Tobacco--acres	26	3	19	35	1,666	2,356	3,639	4,175
Total Pounds	11,985	12,930	9,122	16,003	1,527,350	1,942,234	3,033,089	4,891,126
Pounds per acre	-----	-----	480	465	917	824	847	1,172
6 Hay--acres	-----	8,366	25,946	29,984	27,213	41,407	39,554	43,182

\*Taken from United States Census for Years Selected.

increase until it reached a peak of 10,644 acres harvested in 1945. The total crop value of \$277,087, in the same year, ranks barley as the county's fifth most important crop. The average yield per acre was 20.3 bushels. About half of Tennessee's barley crop is produced in Middle Tennessee, and Maury County ranks second in production among the counties in the state. Barley is grown for winter pasture and for its production of grain for livestock.

Oats.--Oats have had a rather varied history in Maury County. As high as 159,733 bushels were produced in 1945, and the production fell to 37,129 bushels in 1930. The harvested acreage increased from 6,068 acres in 1880 to 18,092 in 1910, then declined to 3,979 in 1925 (Table 5).

Acreage did not show any appreciable increase again until 1940. The decline between 1910 and 1940 was due to the increased use of automobiles and tractors and the resulting decline in workstock (Table 9, page 49). An increase in the number of cattle in the county along with the development of new and improved varieties of oats by the Tennessee Agriculture Experiment Stations account for the increase in oat acreage since 1940.

The oat crop is important in a diversified farming system. It serves as a winter pasture crop, a nurse crop, and as a livestock feed crop. The value of the 1945 oat production, \$159,733, ranks it as the sixth crop in importance in the county. Maury County produced more oats than any other county in Tennessee. The average yield per acre is 26.6 bushels.

Tobacco.--Tennessee ranks fourth among the states in tobacco production and is exceeded only by North Carolina, Kentucky and Virginia. Tobacco ranks second in Tennessee as a cash crop and third in value among all crops. It ranks first in value in Maury County as a cash crop and its total value exceeds that of any other crop. Maury County ranks fifth among the counties of the state in

tobacco production and is exceeded only by Robertson, Green, Montgomery and Sumner counties.

Maury County land is superior tobacco land and the crop can be grown on the same land for several consecutive years with proper fertilization. However, the best yield results after the land has been sown to blue grass for several years. Maury County could produce many times its present annual production except for the planting restrictions imposed by government regulations. Production of Burley tobacco has exceeded consumption in five of the past six years, and a surplus has accumulated.<sup>3</sup>

Tobacco is not an easy crop to raise and prepare for market. It requires intensive cultivation and care. It is sometimes referred to as "the thirteen month crop." Production in the county is limited to Burley, a light air cured tobacco that is used in cigarettes and pipe tobacco. The crop has only been grown commercially since 1921. Acreage in the county was limited to 551 acres in 1925. Table 5 indicates that Burley acreage has shown a marked increase, reaching a peak of 4,175 acres in 1945 with a value of \$2,152,095.<sup>9</sup> This netted the farmers an average of \$515.45 per acre.

The chant of the auctioneer has been heard in the county for more than a quarter of a century. The first warehouse was built in Mt. Pleasant in 1923 and a second in Columbia in 1936. The latter structure has a floor area of approximately 83,000 square feet. Most of the county's production is sold from the floors of these warehouses. The Tennessee Burley Tobacco Grower's Association under the sponsorship of the Farm Bureau has been active in pro-

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<sup>3</sup>H. S. Duncan, "Farm Bureau Big Aid on Burley Plans," Daily Herald, (February 22, 1950), p. 15.

<sup>9</sup>United States Department of Commerce, Agriculture Census (1945).

moting favorable market conditions for Burley tobacco producers in Maury County.

Other Crops.--Most of the farmers have gardens and produce sufficient vegetables for their own consumption. Beans, cabbage, tomatoes, onions, squash, cucumbers, mustard, turnips, and potatoes are a common sight in almost every farm garden.

Sweet Potatoes.--Sweet potatoes are grown generally in small patches throughout the county. The plants are set from May 15th to June 15th and occasionally as late as July 1st. The crop is usually dug about October 1st. Yields of 75 to 100 bushels per acre are not infrequent. Most of these potatoes are consumed by the farm families during the winter months.

Tomatoes.--Tomatoes are grown by nearly every farmer for home use, and commercially in the vicinity of Columbia. One hundred fifty-six acres were planted to tomatoes in 1944.<sup>10</sup> The ordinary yield is five to ten tons per acre. Transplanting usually takes place in June and the crop is harvested in August. The Stone variety is favored for canning. All tomatoes commercially grown are processed by the local canners.

Cantaloupes.--Cantaloupes are produced commercially in the Culleoka Community. The crop is marketed in late July and early August, following the Georgia crop. The Burrel Gem, a pink meat variety, is grown almost exclusively. The average yield is about 200 crates per acre.

Apple Orchards.--There are several commercial apple orchards in the vicinity of Columbia, principally on the gravelly hill soils and on the Highland Rim area of the county where air drainage is favorable. The most popular varieties are Stayman Winesap, Early Harvest, Delicious, Chicago,

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<sup>10</sup>Ibid., Agriculture Census (1945).

and Yates. Satisfactory yields and fruit of good quality are obtained. However, the cost of labor for maintaining these orchards has discouraged commercial producers.

### Forest Resources

Forest and forest products are not an important source of income in Maury County. Most of the original forested land has been cleared for agriculture. The county has a total forest acreage of 110,400 acres with 42,560 acres classified as non-farm land and 67,840 acres as farm woodland.<sup>11</sup> Forests occupy only 29.9 per cent of the land.

Types of Forest.--The commercial forest include the upland hardwoods found mainly on the Highland Rim and to a lesser extent in the Outer Basin and the cedar stands that grow in the Inner Basin. Timber volume is very low in all parts of the county. Growing stock averages about 1900 board feet per acre in the extensive upland hardwoods. This constitutes half of what the basal area would furnish under full stocking.<sup>12</sup> Only about one-half of the forests in the county are fully stocked, considering all well formed trees, from seedlings to saw timber. Over 70 per cent of the saw log volume in the county is made up of third grade trees which are knotty and suited only for low grade uses.

Production.--Total lumber production in Maury County in 1946 amounted to 2,915,000 board feet, of which 2,232,000 board feet were hardwoods and 683,000 board feet were softwoods.<sup>13</sup>

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<sup>11</sup>Tennessee State Planning Commission, op. cit., p. 4.

<sup>12</sup>Williams A. Duerr, Forest Survey Release, No. 63 (1949), p. 4.

<sup>13</sup>United States Bureau of Census, Facts for Industry, Lumber Production in Tennessee, (1946), pp. 7-8.

TABLE 6

## SAW TIMBER AND CORDWOOD RESERVES IN MAURY COUNTY\*

Type	Saw Lumber Bd. Ft.	Cord Wood Cords
Hardwoods . . . . .	83,891	361,000
Softwoods . . . . .	<u>3,114</u>	<u>----</u>
Total . . . . .	<u>87,005</u>	<u>361,000</u>

\*W. Foster Cowan, Forest Resource Appraisal, State of Tennessee, p. 21.

The Bureau of Census reported twenty-four custom saw mills operating in Maury County in 1946. Custom mills are usually owned and operated on a part time basis by persons engaged in other occupations such as farming. The mills are operated during slack agricultural seasons. In custom mill operations, the stumpage owner commonly does the logging and hauling; and the mill operator charges a flat price for sawing the lumber. In some cases, however, private contractors perform all the lumbering operations.

Species.--Several species of commercial hardwoods are adapted to the soils and climate of this area; namely, ash, beech, maple, black gum, hickory, yellowpoplar, and black walnut. Cedar, the only commercial softwood that grows in the county, prefers limestone areas and thrives in the Inner Basin where the soil is thin and platy. Saw timber reserves of Maury County are given by specie in Table 7.

Uses.--Construction and repair of farm buildings require most of the county's production of lumber. Many tobacco barns and sheds have been built in the county during the past twenty years. Columbia and Mt. Pleasant both have lumber and flooring manufacturing plants and Columbia has a chair factory.

TABLE 7

## SAW TIMBER RESERVES IN MAURY COUNTY BY SPECIE\*

Type	Specie	In Millions (Bd. Ft.)
Hardwood	Red Oak	35
"	White Oak	10
"	Yellow Poplar	1
"	Hickory	14
"	Beech	8
"	Black Gum	1
"	Maple	1
"	Other Hardwoods	14
Softwood	Cedar	3

\*W. Foster Cowan, Forest Resource Appraisal, State of Tennessee, p. 24.

However, the use of wood for fuel probably exceeds the use for lumber.

The per cent of low-value species is increasing in the county, while that of the better grades is declining. New developments in the utilization of low grade lumber must follow, as well as methods to provide high grade raw materials for those industries that already exist. Better forest management on a long term basis is the logical solution to the problem.

#### Conservation Practices

Before 1941, when the Maury County Soil Erosion Control Association was organized by the local Extension Service and the Tennessee Valley Authority, commercial fertilizer was not generally used in the county. A program to combat erosion is directed by the above mentioned agencies and functions through organized community clubs. The Tennessee Valley Authority furnishes fertilizers to be used only on pastures, meadows, and non-intertilled crops such as alfalfa, lespedeza and small grains. Phosphorus is essential to the



vegetative cover of legumes and grasses, which in turn are very valuable to combat erosion resulting from heavy rainfall in the county. After a series of tests, it was proven that the soils of the county would respond profitably to the use of fertilizers. Since 1941, 213 tons of triple superphosphate, 500 tons of fused tri-calcium phosphate, 60 tons of phosphate ash, 205 tons of calcium metophosphate and 1,000 tons of ammonium nitrate have been used on demonstration farms in the thirteen community clubs in the county.<sup>14</sup>

The Tennessee Valley Authority has worked out a graduated payment plan for the farmers participating in the Test program. Under this plan, the Test Demonstration farmers who are new in the program or just beginning to revise their farming systems will receive Tennessee Valley Authority fertilizers on payment of freight and handling charges. Farmers in the intermediate stages will pay 50 per cent of the cost of the fertilizer plus the freight and handling charges. Farmers in the later stages of revising their farm procedures, will pay full price for the fertilizer including all freight and handling charges. This plan was put into effect at the beginning of the fiscal year of 1948.

Soil Testing.--Laboratories of the Extension Service of the University of Tennessee offer soil testing service to farmers of the state. Maury County ranks seventh in the State in the number of soil samples tested by this service since it was established in 1944. One thousand five hundred and one samples have been tested as of January 1, 1950, which indicates interest in soil analysis; however, more farmers should take advantage of the service to determine the plant nutrients present and particularly those in which their soils are deficient in order to place their farming on a scientific basis.

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<sup>14</sup>A. Earl Moore, "Erosional Work in Maury a Vital Service," Special Report, (January 22, 1950).

Reforestation.--The reforestation work in the county is confined to relatively small, severely eroded areas, averaging not more than 1.25 acres, except the mined over areas discussed in Chapter VI. Seedling trees, largely black locust, loblolly pine, or short leaf pine, are set approximately six feet apart, which makes about one thousand trees per acre. Farmers average setting approximately 45,000 trees yearly and the phosphate mining companies set approximately 50,000 trees each year.<sup>15</sup>

#### Economic Factors

The greater part of the farm labor is done by the operator and his family. In reality, a shortage of farm labor has existed in the county since the opening of the phosphate mines at the close of the nineteenth century. This shortage was not too obvious until the expansion of the industry in 1938 and 1939. Of the total labor force of 14,466 gainfully employed in the county, 30.5 per cent were employed in agriculture in 1945. The number of tractors on farms doubled between 1940 and 1945. There is roughly one tractor for every nine farms. Fifty-seven and two-tenths per cent of the farms were owner operated; 82.7 per cent of all farm operators were white and 17.3 per cent were colored.

The average value of all farm products either sold or used on the farm in 1945 was \$2,135 compared with \$946 in 1940. Inflation, rather than an increased production, accounts for the great difference in the two figures. Maury County land values are near the record level of the 1920's, the average farm in the county is worth \$6,496 or \$64.74 per acre.<sup>16</sup>

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<sup>15</sup>Richard F. Haynes, Special Report on Farms and Farming Conditions, Maury County, Tennessee, (May 1, 1950).

<sup>16</sup>United States Department of Commerce, Agriculture Census (1945).

## CHAPTER V

## LIVESTOCK

The raising of livestock has always been important in the farming program of Maury County. Livestock and livestock products constitute about half of the entire cash income of the farmers of the county. The principal kinds of farm animals include dairy cattle, beef cattle, horses, mules, hogs, sheep and poultry.

The Columbia Livestock Market, Inc., one of the largest livestock auction markets in the world, handles thousands of horses, cattle, sheep and hogs annually. Transactions totaled \$4,856,826.26 in 1948.<sup>1</sup>

Cattle

Dairy Cattle.--Tennessee is the South's leading dairy state in both number of dairy cattle and value of dairy products.<sup>2</sup> Tennessee is also the outstanding Jersey cattle center in the nation. There are more registered Jersey cattle in Tennessee than in any other state. The distribution of cows and heifers, kept chiefly for their milk, exhibits the greatest density in the Nashville Basin (Figure 4). Registered Jersey cattle form the basis for many fine herds which have put Maury County forward in the dairy industry since emphasis was placed on this activity a few years ago.

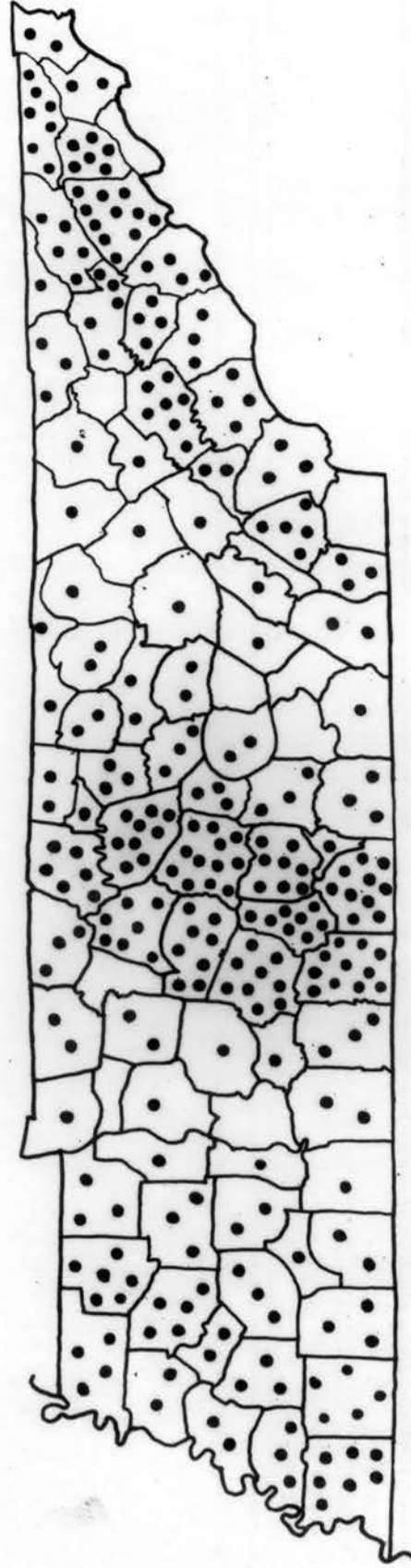
The number of milk cows increased slowly from 1860 when 7,446 cows were reported until 1930 when 10,784 were counted. Since that time the increase has been more rapid. Maury County was credited with 19,700 dairy cows in

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<sup>1</sup>Norman Parks, Report, General Manager of the Columbia Livestock Market, Inc., (August, 1949).

<sup>2</sup>Tennessee State Planning Commission, op. cit., p. 35.

DISTRIBUTION OF MILK COWS 1948



ONE DOT EQUALS 2000 MILK COWS

SOURCE TSDA

FIG.4

1948.<sup>3</sup> This increase coincides with urban population growth in the area. Dairy products of the county supply local milk markets. In recent years, increasing amounts of milk have been manufactured into butter, cheese, and ice cream for local markets. The Borden Company, Craft Cheese Company, Foremost Dairies, and others have established processing plants in Columbia.

Beef Cattle.--The distribution of beef cattle is similar to that of dairy cattle with the greatest density found in the counties of the Nashville Basin. The number of cattle in Maury County has shown a marked increase since 1930 when the United States Census reported 24,092 in the county. This number increased to 39,193 by 1945. The increase in cattle undoubtedly reflects the trend toward a shortage of farm labor and the resultant shift from row crops to grass crops and legumes.

The Tennessee Artificial Breeding Association, active in the county for several years, has made a great contribution to the small breeder in this section of the country. The association has spread from the two original counties, Maury and Williamson, to nineteen counties with twenty chapters. Over 20,000 cows are bred annually, using twenty-one bulls of three major breeds--Hereford, Jersey and Angus.<sup>4</sup>

Importance of Pasture.--Provision of adequate pasture is a major problem of livestock producers and especially the dairy farmer. Pasture is so affected by the weather and the season that it is difficult for the farmer to provide good grazing throughout the year.

Permanent pasture of blue grass and white clover must be supplemented by

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<sup>3</sup>Tennessee State Planning Commission, op. cit., p. 38.

<sup>4</sup>William Thomas, Report, Secretary of Artificial Breeders Association, Maury County (1950).

pasture crops that are brought into use at various times in both hot and cold weather. Lespedeza can be saved entirely for use after June. Sudan grass and pearl millet can be held for the critical summer period which usually comes in July, August and early September. Alfalfa can be grazed a week at a time during dry periods without injury.

It requires good management to provide adequate pastures to maintain milk flow, body weight, or desired growth of cattle throughout the year. With adequate rainfall and autumn temperatures, the European grasses, orchard grass, blue grass, white and Ladino clovers will again furnish excellent pasture. The best late fall, winter and spring pastures for Maury County are the small grains.<sup>5</sup> Balboa rye is probably the best as it grows at lower temperatures than the other cereals. Wheat, oats and barley will also furnish good fall and winter pasture in the prevailing temperatures of the county.

A test conducted during the past winter at the Middle Tennessee Experiment Station proved that cows on winter pasture produce milk more efficiently than barn-fed cows.<sup>6</sup> The cows on pasture produced twenty-one per cent more milk, ate thirty-seven per cent less hay and returned thirty-one cents more per day above feed costs. Through pasture investigation, the Experiment Station is attempting to determine the relative merits of the different legumes and grasses for both hay and pasture and the response which may be expected from different fertilizers.

In 1945 Maury County had 63,364 acres of cropland in pasture, 85,665

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<sup>5</sup>Lake E. Noel, Special Report--Grass, Clover is Backbone, Grains Needed for Pasture (1950).

<sup>6</sup>E. J. Chapman, Daily Herald (February 22, 1950), p. 10.

acres of open permanent pasture land and 25,714 acres in woodland pasture.<sup>7</sup> An authoritative source estimates that the county, in 1950, has 68,384 acres in cropland pasture which averages being in pasture three years out of four, 95,665 acres of open permanent pasture which remains in pasture from five to twenty-five years, and approximately 25,714 acres of woodland pasture. This represents an increase in pasture land of 14,286 acres since 1945.<sup>8</sup>

The same source estimates that five hundred acres of the increased pasture came from lands previously in woods, five thousand acres resulted from longer rotations probably removed from small grains, and the remainder of 8,736 acres was diverted from corn acreage. Sixty-eight thousand three hundred and sixty-four acres are cropland pasture and classed as improved permanent pasture land and 71,741 acres are in permanent pasture. The remainder should probably be classed equally in acreage as good, fair, and poor with approximately 7,974 acres in each class. Erosion is controlled satisfactorily on the improved and good pastures, and of course, in the woods. The pasture land classed as fair and poor should be improved by applications of lime, phosphate, and seeding.

#### Horses and Mules

Horses.--The raising of fine horses in Maury County has become a tradition. Before racing was discouraged by the passage of betting laws several decades ago, Maury County and Columbia were to trotting and pacing stock what Lexington, Kentucky, is to running horses. The Tennessee Walking Horse, a descendant of an original fine racing stock, was recognized as a breed

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<sup>7</sup>United States Department of Commerce, Agriculture Census (1945).

<sup>8</sup>Richard T. Haynes, Special Report (May 25, 1950).

about twenty years ago. Walking horses are useful for farm purposes as well as for pleasure and show purposes. The average price paid for walking horses in local sales in 1945 was \$691.12 per head.<sup>9</sup> Prices are somewhat

TABLE 8

## REGISTERED STALLIONS ENROLLED IN MAURY COUNTY\*

Owner	Address	Name & Registration No.	Date Foaled	Tennessee Walking Horse	American Saddle Horse	Percheron	Miscellaneous Horses
Beasley, E.	Williamsport	Dick Hunter Allen	1935				1
Haynes Haven Stock Farm	Spring Hill	King of Heaven-- 419283	1940	1			
Haynes Haven Stock Farm	Spring Hill	General Genius-- 22564	1942		1		
Porter, Sam	Mount Pleasant	Trixie's Tom Allen-- 430120	1939	1			
Sewell, Algie	Carters Creek	Hal Agot--370072	1933	1			
Stephenson, Keywood	Columbia	Step-On-Son--453406	1945	1			
Trimble, Ernest Priest	Carters Creek	Rambling Smokey-- 421977	1942	1			
Watson, Lex	Columbia	Billie Wonder--23168	1940				1
Watson, Lex	Columbia	Merry Boy's Chief-- 370190	1934	1			
Wilkins, C. B. & Co.	Columbia	Wilkins Roan Allen-- 440234	1943	1			
Williamson, J. R.	Culleoka	Jack Garner--410765	1938	1			
Williamson, J. R.	Culleoka	General Forrest--390484	1939	1			

\*Tennessee Stallion Enrollment Board, Report, June 30, 1948, Nashville, Tenn.

<sup>9</sup>Tennessee Department of Agriculture, Farming and Living, Biennial Report, (1944-46), p. 227.



lower at the present time. The emphasis placed on the breeding of walking horses in Maury County during the past decade is shown by the large number of registered stud horses in the county (Table 8).

The demand for draft horses, like that of mules, has declined in the county since 1920 due to farm mechanization. The number of horses decreased from 9,394 in 1910 to 3,426 in 1945.

TABLE 9

LIVESTOCK PRODUCED IN MAURY COUNTY<sup>1</sup>

Livestock	Year							
	1860	1880	1900	1910	1920	1930	1940	1945
Cattle	10,214	9,021	-----	22,841	28,502	24,092	30,243	39,193
Cows,	7,446	6,280	6,282	7,645	7,165	10,784	14,452	17,538
Milked								
Mules	8,805	8,301	5,784	8,126	8,194	5,328	5,416	4,858
Horses	11,440	7,698	7,656	9,394	7,600	4,211	3,869	3,426
Hogs	97,673	53,851	37,267	37,281	55,490	32,513	24,954	22,137
Sheep	21,181	19,066	6,884	48,546	16,827	50,061	23,459	20,308
Chickens	---	78,421	129,665	180,423	241,667	198,062	155,596	209,840

<sup>1</sup>United States Census for years selected.

Mules.--Maury County is especially well known in agricultural circles for its fine mules. However, the raising of mules has declined somewhat in importance with the coming of the motor age and mechanization of farms in the area.

Two types of mules are bred in the county--the "cotton" mule that weighs from 900 to 1,250 pounds and is used on small farms and in the cultivation of light, thin soil, and the "sugar" mule that is better adapted for heavier

work and weighs from 1,300 to 1,600 pounds.<sup>10</sup>

There was a steady increase in the number of mules raised in the county from 1860 to 1920 and then a decline in numbers from 1920 to 1945 (Table 9). The decrease is due to less acreage in row crops and an increase in the number of tractors on farms in the area. Mules had an average value of \$125 per head in Tennessee in 1948.

Maury County farmers insist that the large and fine bone structure of its farm animals is due to the blue grass pasture and feeds produced from soils rich in phosphorus. The following is quoted from a report by the Tennessee State Department of Agriculture.

An optimistic outlook for Southern mule breeders, expressed by Dr. J. C. Miller of the University of Tennessee, keynoted the 1947 annual meeting of the Tennessee Jack, Jennet and Mule Breeders' Association which met at the Middle Tennessee Experiment Station at Columbia. Dr. Miller cited a decline in the mule population in the mid-western mule producing states of 64% in the 16 years, as compared with a very small decline in the southern cotton growing states. He showed, furthermore, that the price of mules in the mid-western states had greatly fallen off, whereas in the southern states there was a slight increase in prices.

In the southern states at the present time, he also pointed out, there was approximately only one young mule (under twenty-seven months) for every eight four-year-old mules. From these figures Dr. Miller concluded:

1. In spite of increased mechanization, small cotton farmers will need mules.
2. The mid-western states are definitely going out of the mule-producing business.
3. In that event the market will be open for Tennessee mule producers, provided they can have the animals ready.<sup>11</sup>

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<sup>10</sup>Mrs. Ruel Sellers, Columbia as a Mule Market (Unpublished Report), pp. 1-3.

<sup>11</sup>Tennessee State Department of Agriculture, Farming and Progress (1948), p. 262.

### Other Livestock

Hogs.--The production of hogs has long been an important factor in the agricultural economy of Maury County. From 1860 to 1890, Maury County was consistently credited with more than 50,000 hogs, and from 1890 to 1910, with more than 30,000. In 1920 production of hogs reached 55,490 due to high prices following World War I. Since this time, the number of hogs has decreased in the county along with the corn acreage. The largest numbers of hogs are raised in the Outer Basin area of the county where the better farm land is planted to corn. The Agricultural Census of 1945 reports 22,137 head of hogs in the county.

Sheep.--Maury County is exceptionally well adapted to sheep and lamb production. Here one finds a favorable climate, ten to twelve months pasture, and an ample supply of feed and water. Maury County's early spring gives her a distinct advantage in northern markets for her early spring lambs. Sheep make excellent use of the feed they consume. This enables them to produce gains at low cost. They also add greatly to the fertility of the soil as maintaining soil fertility is one of Maury County's big problems in agriculture today. The uneconomical size or small flocks of sheep in the county need to be increased. The census of 1860 credited Maury County with 21,131 sheep. This number increased to 43,346 in 1910 and reached a maximum of 50,061 head in 1930. The increased demand for dairy products in the region has caused the number of sheep to decline since 1930 (Table 9).

Chickens.--Most of the chickens raised in Maury County are in farm flocks, fewer than two per cent of the farms being classified as poultry farms. The Agricultural Census of 1945 reports 209,340 chickens in the county, and a total production of 1,163,401 dozen eggs for the same year.

The importance of the livestock industry in Maury County is well indicated by a recent report prepared by the Tennessee Department of Agriculture in which Maury County ranked among the ten leading counties of the state in livestock production. The county had the following rank among the Tennessee counties: cattle and sheep, fourth; milk cows, fifth; mules, hogs and chickens, seventh. The diversification of the county's farm program is further witnessed by the following crop rank among the counties of the state: rye and oats, first; barley, second; hay, fourth; tobacco and wheat, fifth; and corn, tenth.<sup>12</sup>

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<sup>12</sup>Tennessee State Department of Agriculture, Agricultural Trends in Tennessee (1948), p. 9.

## CHAPTER VI

## PHOSPHATE RESOURCES

The United States has a generous reserve of phosphate rock with important deposits found in three major regions: (1) Tennessee, (2) Florida, and (3) a group of western states consisting of Idaho, Montana, Wyoming, and Utah. The central location of Tennessee and her nearness to the major soil-depleted farming regions of the country has given economic importance to the phosphate industry of the state. At present, Tennessee accounts for about 20 per cent of the nation's total production of phosphate.<sup>1</sup> Production in 1939 amounted to approximately 939,448 long tons, valued at \$3,856,505. According to the United States Bureau of Mines, phosphate rock reached its peak production in Tennessee in 1947 when 1,500,000 long tons were mined.

Location and Origin of Phosphate Rock in Maury County

The commercially important phosphate rock of the state occurs in middle Tennessee. There are three principal types: brown rock derived from the weathering of phosphatic Ordovician limestone, blue rock which is bedded solid rock-phosphate deposits of late Devonian or Mississippian age, and white rock consisting of chemical replacement deposits in Silurian and Devonian formations.<sup>2</sup>

Brown phosphate rock is by far the most important of the phosphates mined in Tennessee. The brown phosphate deposits are located almost exclusively

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<sup>1</sup>Data: Monsanto Chemical Company, "Industry Applications of Phosphorus Show Rapid Growth." Business Week (September, 1948), pp. 50-52, 54, 59.

<sup>2</sup>Tennessee State Planning Board, Industrial Resources of Tennessee (1948), p. 88.

in the Nashville Basin, but are restricted to the western edge where the Basin joins the Highland Rim Plateau. The bulk of the deposits occur in Maury County and the adjacent counties of Giles and Williamson. Hickman, Lewis, Marshall, Lincoln, Sumner, and Davidson counties also contain deposits of some importance (Fig. 5). Blue rock phosphate is largely limited to the Swan Creek district of Lewis and Hickman counties, while the white rock phosphate occurs in commercial quantities in Perry and Decatur counties.<sup>3</sup>

The brown phosphate rock of Middle Tennessee, and hence Maury County, results from weathering and leaching of the phosphatic Ordovician limestone.<sup>4</sup> The brown phosphates are associated with more than one layer of limestone but each of the layers is of Ordovician age. The weathering of the rock has continued since the end of the Pliocene period, when the Nashville Basin was eroded to its present size and the surface was worn down until the phosphatic limestones were exposed.<sup>5</sup> The extent of the leaching of the Ordovician limestone is closely related to the tectonic disturbances which the Nashville Basin has undergone.<sup>6</sup>

The deeply incised rivers, which drain the basin, indicate that there has been some recent uplifting of the area. This uplift has allowed ground water to penetrate to a lower level than formerly and has increased the leaching process. There is also abundant jointing in the limestone caused by fracture

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<sup>3</sup>Ibid., p. 88.

<sup>4</sup>Richard Smith and Geo. I. Whitlatch, The Phosphate Resources of Tennessee (1940), p. 43.

<sup>5</sup>Ibid., p. 12.

<sup>6</sup>H. Thompson Straw, "Phosphate Lands in Tennessee," Economic Geography, V. 17, (January, 1941), pp. 97-104.

during the uplift. The thickest deposits of phosphate are found in the joints known as "cutters" after the calcium carbonate has been removed in solution and replaced by residual phosphate.<sup>7</sup>

Mining of brown phosphate in Maury County centers around Mt. Pleasant and Columbia (Fig. 5). The mineral was first mined in the Mt. Pleasant District in 1896. This district very soon developed into the major producing area of the county. The Mt. Pleasant district is an elliptical area about four miles long and two miles wide.<sup>8</sup> It is drained by Big Bigly, Sugar and Quality creeks. This area was covered by a blanket deposit of phosphate, ranging in depth from two to ten feet with additional drainage channels or "cutters" filled with rich lump rock.

The total production of brown phosphate rock in the Mt. Pleasant District from the year 1896 to the year 1937 amounted to 13,529,373 long tons with a value of \$57,970,268.<sup>9</sup>

The Columbia phosphate district, a large area in the center of Maury County, includes the following sub-divisions or areas: the Campbellville, Pulaski and Moorsville Pikes south of Columbia; the Hampshire and Williamsport Pike area west of Columbia and south of Duck River, the Godwin and Darksmill area north of Duck River and Columbia; and the Bear Creek area northeast of Columbia. This district is drained chiefly by Duck River (Fig. 5).

The chief products of Maury County's phosphate industry are super-phosphates for fertilizer, raw ground rock-phosphate fertilizer for direct application to the soil, and elemental phosphorus.

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<sup>7</sup>Smith and Whitlatch, op. cit., p. 45.

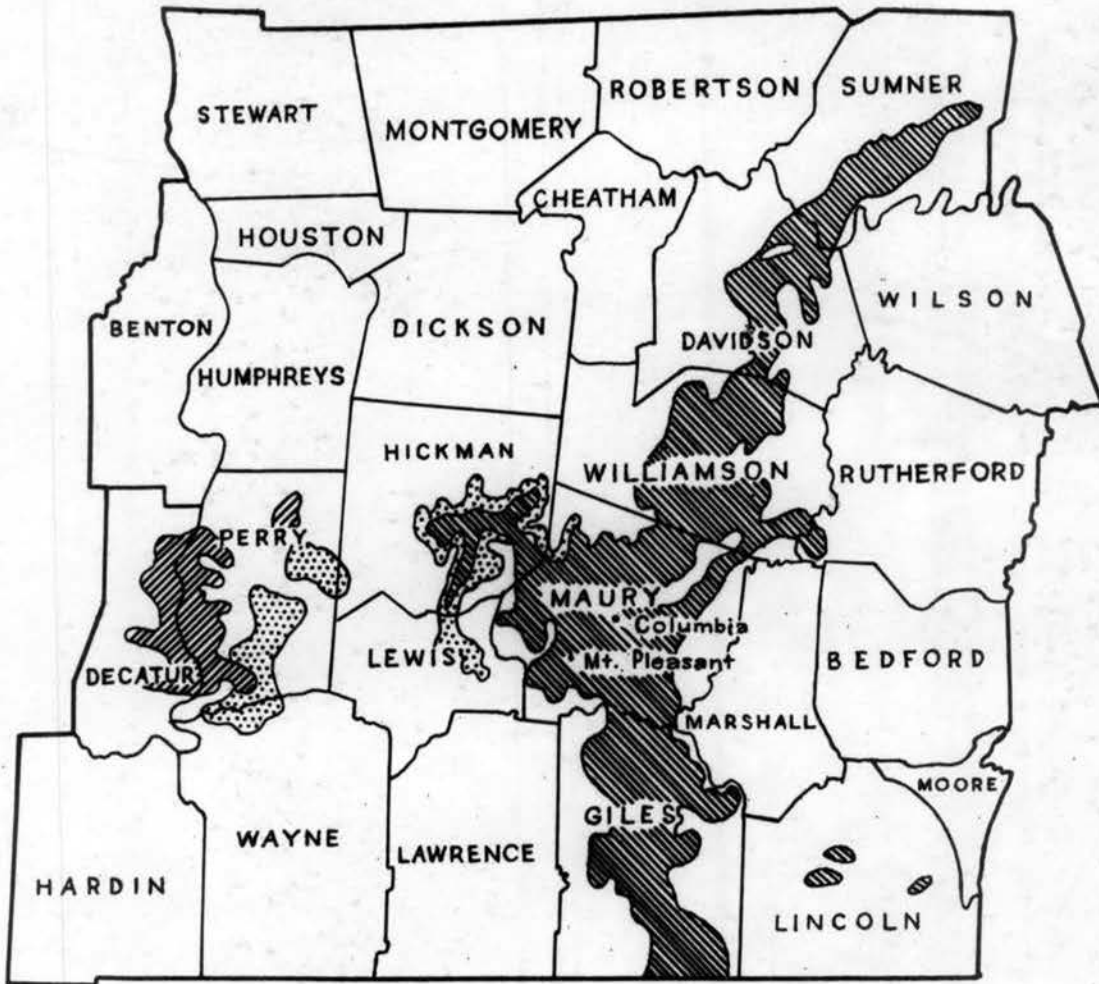
<sup>8</sup>Ibid., p. 57.

<sup>9</sup>Ibid., p. 63.

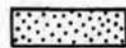
# PHOSPHATE RESOURCES

of

## MIDDLE TENNESSEE



### LEGEND



BLUE PHOSPHATE



BROWN PHOSPHATE



WHITE PHOSPHATE

Scale Miles

Source: T S P C

FIG. 5



Companies operating in the county include Armour Fertilizer Company, Federal Chemical Works, Hoover and Mason Phosphate Company, International Minerals Corporation, Monsanto Chemical Company, the Tennessee Valley Authority, Victor Chemical Company, and the Virginia-Carolina Chemical Company.

Victor and Monsanto Chemical Companies are producing elemental phosphorus by the electric furnace methods. Their combined total of eight furnaces ranks as the world's largest producer of this element.<sup>10</sup> The Tennessee Valley Authority washes and sinters phosphate for its elemental phosphorus furnaces at Muscle Shoals, Alabama. Hoover and Mason produce raw ground phosphate rock which is sold for acidulation, stock feeds, parting compounds and as fertilizer for direct application to the soils.

#### Prospecting

The first operation in a potential mining section is prospecting. The outcrop boundaries of the deposit are located so that time will not be wasted by prospecting above or below the deposit. A grid system is set up with lines one hundred feet apart. At the corner of the 100-foot grid a prospect hole is located. Holes are drilled at these points on the grid by sinking vertically through the overburden and phosphate deposits an auger or drill inside a casing which is about four and one-half inches in diameter. The material is sampled every six inches in depth until it is agreed that the overburden has been passed through. This material is discarded and its depth recorded. The drilling continues down into the phosphate strata until limestone or clay bottom is reached. Samples representing each noticeable physical change in the phosphate, as distinguished by color and feel, are carefully

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<sup>10</sup>Tennessee State Planning Commission, op. cit., p. 89.

tagged for further analysis. Prospecting, by the above method, determines for each hole on the grid the thickness of the overburden and of the phosphate deposit. It also indicates the grade of phosphate that can be expected in the mining of the rock.

### Mining Operations

After a field has been located, the overburden is removed by draglines usually electrically driven. The dragline is a huge machine that has a fifty to seventy foot boom which swings out over the "digging" or the area to be mined. The overburden is scooped up in "buckets" and carried to the side and dumped. Buckets in use have a capacity of eight to twelve cubic yards. After removing the overburden, the phosphate rock is dug by dragline excavators and dumped into tram cars or trucks and hauled to the washers.

The washing plants are mainly a series of vibrating sizing screens, and log washers. The phosphatic materials are agitated in water and passed over screens where mud balls, limestone fragments, and chert nodules are separated from the mineral. The waste from the washer was formerly discarded, but with the flotation process employed since 1930 there is a recovery of about 94 to 95 per cent where formerly only about 40 per cent of the phosphate was recovered at the washer. Improved efficiency of recovery has maintained the industry after the bulk of high grade ore has been exhausted in the county.

### Treatment of Phosphate Rock

The treatment or processing of phosphate rock depends upon its intended use. However, since 90 per cent of all mined phosphate rock is processed for fertilizer, a description of the treatment will be largely restricted to that intended purpose.

Only eight per cent of the country's total production of mined phosphate rock is sold as fertilizer for direct application to the soil.<sup>11</sup> Most of the phosphate used for direct application comes from the brown phosphate rock fields in Tennessee and find its greatest market in the midwestern states.<sup>12</sup> The only preparation is drying and very fine pulverization.

The greatest amount of phosphate rock used in the United States is applied to the soil in the form of superphosphates. Sixty-seven per cent of all the mined phosphate rock is processed into superphosphates. The phosphatic fertilizer most widely used in agriculture is ordinary superphosphate, produced by a method which has been used for nearly a hundred years with little change other than a few improvements in mechanical equipment. Natural phosphate is ground, then treated with an equal weight of sulfuric acid and the resultant product allowed to dry and cure. As ordinarily made, superphosphates carry 16 to 20 per cent of plant nutrients expressed as  $P_2O_5$ .<sup>13</sup> Small quantities of superphosphates, with food nutrients of 45 to 48 per cent  $P_2O_5$ , are produced by treating the ground rock phosphate with phosphoric acid. Farmers have been slow to use the more concentrated fertilizers, partly from a lack of knowledge of the facts relative to the saving in the cost of distribution of the concentrated product and perhaps partly in their native conservatism. Manufacture of the more powerful superphosphates on a large scale calls for an increased amount of phosphoric acid and the electric furnace process seems to be the answer.

In 1935, the Swan Chemical Company of Alabama merged with Monsanto

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<sup>11</sup>Data: Monsanto Chemical Co., loc. cit.

<sup>12</sup>Straw, loc. cit.

<sup>13</sup>The Tennessee Valley Authority, Chemical Engineering Report No. 1, (1948), p. 2.

Chemical Company for the purpose of large scale phosphorus production by the electric arc furnace process. A large plant was established in the heart of the brown phosphate fields near Columbia, Tennessee, and the production of yellow phosphorus started in 1937. The phosphate-bearing earth is strip-mined near the plant, washed, sintered, and processed electrically to produce yellow phosphorus which is better than 99.9 per cent pure.

The basic chemical reaction in the electric arc process is the intra-reaction of phosphate rock, coke, and silica sand. The electric arc method requires a temperature of 1300-1500° C., produced by 10,000 KW of electricity.<sup>14</sup> This heat reduces free phosphorus pentoxide to elemental phosphorus vapor; the silica sand combines with the resulting lime to form a slag. The yellow phosphorus condenses from the top of the reaction chamber, runs into a storage tank where it is kept at a temperature just above its melting point of 111° F., under water. (The element is always kept under water; it ignites spontaneously on contact with air.) For shipping, it is pumped into steel tank cars under water; cold water running through pipes in the cars solidifies it. Then, for unloading, hot water sent through these same pipes melts the phosphorus so it can be pumped out.<sup>15</sup> Production from the local plant is shipped to Monsanto's plants in Monsanto, Illinois, and Trenton, Michigan, for conversion into phosphoric acid, phosphates for heavy industry, and the manufacture of such consumer products as detergents, water softener, baking powder and flour.<sup>16</sup>

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<sup>14</sup>"Another Furnace Added to World's Largest Phosphorus Works in Tennessee," Manufacture's Record (December, 1948), p. 46-47.

<sup>15</sup>Data: Monsanto Chemical Company, loc. cit.

<sup>16</sup>"Monsanto Adds Fifth Battery to Columbia, Tennessee, Plant," Chemical Engineering News (November 8, 1948), p. 3360.

Fig. 6. Spectacular appearance of this furnace at Monsanto is due to the glow of molten slag and metal and the brilliant flares of excess carbon monoxide.

Fig. 7. All phosphate mining is by strip method in Maury County.

Fig. 8. Hydroelectric power is transmitted to the Columbia area from Muscle Shoals, Alabama.



Phosphorus Plant at Night

Photo—Orman, Columbia.

Phosphate Mining



TVA Substation

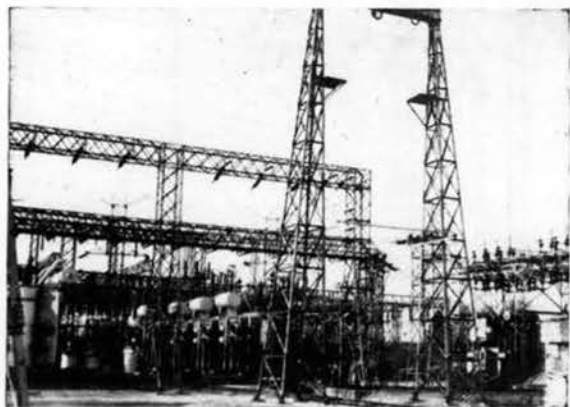


Fig. 8.6.

A compound of iron and phosphorus obtained from the slag is the steel industry's principal source of phosphorus for special steels. The Tennessee Valley Authority furnishes cheap hydro-electric power which is transmitted from Muscle Shoals, Alabama, for the industry.

TABLE 10

## PHOSPHATE COMPANIES OPERATING IN MAURY COUNTY\*

Name	Product	Manager	Employees
Armour Fertilizer Works	Fertilizer, Allied Chemicals	W. B. King	225
Federal Chemical Company	Phosphate Mining	D. I. Miller	250
Hoover-Mason Phosphate Company	Phosphate Mining	Ronald Morrison	130
International Minerals & Chemical Corporation	Phosphate, Chemicals	Floyd Bowen	82
Monsanto Chemical Company	Elemental Phosphorus	E. J. Bock	550
Tennessee Valley Authority	Phosphate Division	H. R. Mosley	290
Victor Chemical Company	Elemental Phosphorus	F. B. McCoy	400
Virginia-Carolina Chemical Company	Phosphate, Chemicals	R. J. Gisson	400

\*Columbia Herald, Daily Newspaper (July, 1949).

### Labor

The mining of phosphate and its related industries in Maury County furnish employment to a large number of people. Labor which would otherwise compete for work on the farms of the county find employment in mining. The number of workers employed by the eight major phosphate companies in the county

is given in Table 10. This labor force is made up almost entirely of local citizens.

#### The Problem of Strip Mined Areas

Fortunately most of the phosphate deposits have occurred in marginal agricultural areas along the slopes of the hill land leaving the better, more tillable land for mechanized agriculture. The mined-over areas have been allowed to remain in a natural mined-over condition for three reasons: (1) because as technological developments occur these lands will be mined over again and it will be more economical to mine from consolidated dumps rather than work over a much larger surface area to collect the phosphatic material; (2) because the land originally was marginal agricultural land with limited possibilities of cultivation;<sup>17</sup> and (3) because of the ridged condition resulting from mining, these mined-over lands create needed provisions to retard erosion and rapid run-off of the heavy rainfall which normally occurs in Maury County.<sup>18</sup>

The present method of reclamation is to plant cover crops such as native lespedeza and sweet clover on the mined-over land immediately after the company is through mining. After a little humus has been built up or a cover crop has been developed to eliminate erosion, a reforestation project is begun by planting black locust and other native hardwoods.<sup>19</sup> After a few

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<sup>17</sup>The land's natural use as pasture land is equally well served in its ridged condition and does not justify a releveling cost of \$100 to \$200 per acre which would be twice to four times the value of the land either before mining or after releveling.

<sup>18</sup>Robert I. Bourne, Special Report, Victor Chemical Company (January 31, 1950).

<sup>19</sup>R. S. Morrison, General Manager of Hoover and Mason Phosphate Company, Letter, (January, 1950).



years, it is easy to get good stands of blue grass pasture. This conserves moisture and eliminates erosion.

As the demand for phosphate fertilizer increases and improved methods of mining make it profitable to mine areas of low-grade phosphate, one may expect some of the better farm land of the county to succumb to the fate of the drag-line. During the summer of 1949, the writer observed open pit mining along the highway in the Cross Bridges Community where some of Maury County's choice farm land is found.

An unpublished report of a survey made in March, 1944, of the mined areas of Maury County by the Tennessee Division of Forestry, Department of Conservation, is submitted in full as follows:

During the week of February 8th to 16th a survey was made of the strip mining done by the eight major phosphate producers of Maury County, to determine the acreage mined over by the operators and to determine the future use that will make the land most productive after mining is completed.

A total of 2953 acres have been mined on the holdings of the following companies:

Armour Fertilizer Works  
 Virginia-Carolina Chemical Company  
 Federal Chemical Company  
 Hoover & Mason Phosphate Company  
 International Minerals & Chemical Corporation  
 Monsanto Chemical Company  
 Victor Chemical Company  
 Tennessee Valley Authority

This area represents less than 1% of the total acreage of Maury County which is shown as 392,960 acres in the 16th Census Report (1940). In addition to the area mined on the above holdings there are less than 1000 additional acres that were hand-mined by individuals or small companies in the early days of the industry. The total holdings of these eight major companies consist of 24,750 acres, a little over 6% of the County area.

Of the mined area approximately 125 acres (10%) should be converted to agriculture and pasture, 350 acres have been planted to forest trees and the remainder of the mined area should be devoted to forestry (2,243 acres).

### Agricultural Use

In connection with the agricultural use of the mined area, serious consideration should be given to pasture on areas not suitable to crop cultivation. On such areas a combination of blue grass, bermuda grass and lespedeza will furnish good pasture without the cost of releveling the land.

The leveling of the above land has been done by the F. V. A. and by individual farmers on whose land phosphate was mined. Planting has been done by Hoover and Mason Phosphate Company, Monsanto Chemical Company, Victor Chemical Works, or by T. V. A.

### Unmined Areas

Of the total 24,750 acre holdings of these companies, it is estimated that 4,500 acres (19%) should eventually be devoted to Agriculture. Of this area 2,000 acres are suitable for cultivation and 2,500 acres for pasture.

The remainder of the company holdings (20,250 acres) are marginal or sub-marginal land which should be devoted to forestry. Of this, 13,000 acres are blocked in consolidated areas that may be eventually formed into a state forest as follows:

Block 1--4000 acres. Including lands of Monsanto Chemical Company, Federal Chemical Company, and Armour Fertilizer Works. This block lies 6 miles west of Columbia on the Centerville Pike between Armour Village and the Duck River.

Block 2--8000 acres. Includes lands of Hoover & Mason Phosphate Company, Federal Chemical Company, Victor Chemical Works, and International Minerals and Chemical Corporation south and east of Mt. Pleasant.

Block 3--1000 acres. Lands of Armour Fertilizer Works lying east of Mt. Pleasant.

The area not included in these blocks is more or less scattered throughout the county and should be devoted to private forestry.

However, a state forest could only be developed after mining is completed on the area within these blocks. History of phosphate mining is that as improved methods of extraction are developed a lower grade phosphate rock may be mined economically, with a result that some areas have been mined over as many as four times. It is the general belief by the operators that parts of the area now being mined will be worked over again when methods are devised to utilize lower grade phosphate rock.

### Forestry Use

Plantings of forest trees have been successful on the mineral

areas with exceptions of some mortality due to grazing, dry weather, etc. Loblolly Pine, Shortleaf Pine and Black Locust seem to grow faster and have better survival than other species planted. Trees will grow on practically all of the mineral areas, can be planted economically and will hold the soil. The only disadvantage to forestry is the remaining may take place before the timber crop is ready for harvest, but by favoring the pine and locust which are fast growing trees and which have a market value in small sizes, it should be profitable to practice forestry.

The holdings shown for individual companies in this report consist of both free land and land on which the companies own mineral rights only.

### Fluorosis

Probably the most recent problem created by the phosphate industry is fluorosis, a disease affecting livestock in the area caused by the effluents of fluorine in the escaping gases from the sintering plants. Monsanto announced plans at the dedication of the new furnace in 1948 for the construction of a washing unit to eliminate fluorine gas from the smoke emitted from their plant. Under the new process, the gases will be scrubbed with a liquid spray which absorbs fluorine. The scrubbing process, the result of several years of research and study, is expected to eliminate any possible contribution on the part of Monsanto to the presence of fluorosis in the area.<sup>20</sup>

E. J. Chapman of the Middle Tennessee Agricultural Experimentation Station, Maury County, states in an article published in the Columbia Herald, February 22, 1950, "The effects of fluorine bearing effluents on the grazing experiments and other livestock projects are unknown and at the present time a very comprehensive program is under way to study these effects."

### Phosphate Reserves and Future of the Industry

The phosphate reserves of Tennessee are strategically important because

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<sup>20</sup>Richard T. Warren, Chemical Engineering (December, 1948), p. 189.

they are located near the large phosphate consuming areas of the cotton and corn belts and because of their nearness to the munition plants at Muscle Shoals, Alabama. They were the source of practically all the phosphorus used for munitions in World War II. The war demand removed only 0.12 per cent of the nation's total reserve, but these withdrawals took 6 per cent of Tennessee's deposits.<sup>21</sup>

TABLE 11

## AN ESTIMATE OF BROWN PHOSPHATE RESERVES IN TENNESSEE, JUNE, 1939\*

County	Principal Geologic Source Rocks	Minimum Average Grade Included In Estimate	Phosphate Ore in Ground, Dry Basis
		B.P.L. Per Cent	Long Tons
Maury: . . . . .	Bigby-Cannon . . . . .	40	42,103,500
	Hermitage . . . . .	40	740,000
	Total for county . . . . .		42,843,500
Giles: . . . . .	Bigby-Cannon . . . . .	40	14,690,000
	Hermitage . . . . .	25	2,166,000
	Total for county . . . . .		16,856,000
Williamson: . . . . .	Bigby-Cannon . . . . .	40	17,413,900
	Hermitage . . . . .	25	2,105,000
	Total for county . . . . .		19,518,900
Hickman: . . . . .	Leipers . . . . .	40	12,195,000
Davidson: . . . . .	Bigby-Cannon . . . . .	40	3,504,900
	Hermitage . . . . .	30	1,000,000
	Total for county . . . . .		4,504,900
Lincoln and Sumner:	Leipers, Cannon, Hermitage.	35	1,000,000
	GRAND TOTAL . . . . .		96,918,300

\*Richard Smith and Geo. I. Whitlatch, The Phosphate Resources of Tennessee (1940), p. 383.

<sup>21</sup>The Tennessee Valley Authority, Fertilizer Technology (1949), p. 50.

It is difficult to accurately estimate the brown phosphate reserves of Tennessee because much of the area has not been geologically mapped and prospected. George I. Whitlatch's limited estimate of brown phosphate reserves in Tennessee as of November, 1940, is cited in Table 11.

Authorities in the field believe that with improved technology in methods of mining and recovery that the estimated reserve is sufficient for a commercial industry in the county for a hundred years or more.

## CHAPTER VII

## SUMMARY

Maury County, situated on the southwestern periphery of the Nashville Basin in Middle Tennessee, comprises a considerable area of Inner Basin, Outer Basin and Highland Rim country. The latter area is flat to undulating with many narrow, round, or flat top ridges. Cedar glades and limestone depressions characterize the Inner Basin division while the more rolling Outer Basin area includes the Highland Rim remnants or knobs. These knobs are most noticeable in the south and western parts of the county. The county contains 618 square miles and was established in 1807.

The climate of the county is favorable for man and his activity. It has a growing season of 195 days extending from April 9th to October 21st. The average annual precipitation is 49.94 inches and is well distributed throughout the winter, spring, and early summer months when it is most needed for growing crops. The mean winter temperature of the county is  $40.0^{\circ}$  F. with extremes of  $-13^{\circ}$  F. and  $79^{\circ}$  F.; while the mean summer temperature is  $71.1^{\circ}$  F. with absolute extremes of  $42^{\circ}$  F. and  $108^{\circ}$  F.

The soils of the county are developed mainly on materials weathered from limestones and are closely associated with the physical divisions of the area. The soils of these divisions differ greatly in their fertility and ability to produce. The soils of the Inner Basin are derived from low phosphatic limestones and are only moderately well supplied with the major plant nutrients. These soils are drouthy and are difficult to maintain in good tilth. Soils of the Outer Basin are weathered from phosphatic limestones and contain an ample supply of phosphorus which makes them very productive. The Highland Rim section of the county is predominately hilly

and steep, and cultivation of its soils is difficult. Most of the soils of this section are derived from materials weathered from very cherty limestones and are low to very low in fertility. The county is well drained by Duck River and its tributaries. Most of the streams have cut deep channels and are consequently bordered by lands seldom overflowed.

Early settlers arrived in Maury County by the way of Duck River and the Indian trails that traversed the county. The economic and cultural progress of man was soon facilitated by the development of other routes and carriers for the exchange of goods.

Many of the early settlers consisted of persons who had received large tracts of land from North Carolina for services in the Revolutionary War. The present white population of the county is composed largely of the descendants of these early settlers, while the colored population is comprised mainly of the descendants of the liberated slaves. The sixteenth United States census, 1940, reports a total county population of 40,357; 74.8 per cent native white, 25.1 per cent colored, and 0.1 per cent foreign born. The county's population has increased but little in the last half century while the urban centers of Columbia and Mt. Pleasant have grown considerably.

The median family income in Maury is above the state average of family incomes; however, there is a strong contrast in the standards of living maintained by the people of the three physical divisions, due largely to the differences in soil fertility.

Columbia, the county seat, occupies a favorable location for trade and has expanded its retail and wholesale trade territory beyond the limits of the county. The city has a diversity of industry including the manufacture of hosiery, carbon electrodes, chairs, work clothing, flour, cheese, meat

packing, and the preparation of stock feeds and fertilizers. Columbia is a focal point for state highways and is served by the Federal Highway No. 31 which leads from Nashville to Birmingham and other points in the South. It is also served by the main line of the Louisville and Nashville Railroad.

Mt. Pleasant owes its growth largely to the rich phosphate deposits in the surrounding area. It also serves as a financial and trading center for the farm community that reaches into the interior of the Outer Basin.

A broad diversified system of agriculture is practiced in Maury County with emphasis on feed crops for livestock and dairy farming. The main crops are corn, tobacco, hay, wheat, oats, barley, and other small grains. Tobacco, the chief cash crop, is the only intensively cultivated crop grown in the county and occupies about 3 per cent of the total cultivated area.

The acreage in row crops has decreased during the past half century due to the scarcity of farm labor and increased demand for dairy products. Through the efforts of the County Agent, the Middle Tennessee Experiment Station and other agencies, improved methods and conservation practices have been introduced to the farmers. Much of the land is now being returned to permanent pasture. Fertilizer is applied to pasture acreages as well as to the row crops. Maury County ranks seventh among Tennessee counties in the number of soil samples tested since a program for that purpose was initiated in 1944. Seasonal farm labor has not been abundant in the county since the discovery and initial development of phosphate deposits near the close of the last century. Most of the farm work is done by the operator and his family. Much of the forested land has been cleared for agriculture.

Forests do not constitute an important source of income, but some effort is being exerted to reestablish trees on the land best adapted to that use.



Reforestation work in the county is confined to relatively small, severely eroded areas averaging not more than 1.25 acres except on lands which have been mined for phosphates.

Livestock and livestock products contribute about half of the entire cash income of the farmers. Cattle, hogs, sheep, horses, mules and chickens are the important kinds of livestock raised, with emphasis on dairy cattle. Dairying has developed into one of the big money industries of the area. Provision of adequate pasture is a major problem of the livestock producers; but, with good management and careful planning, grazing can be provided throughout the year.

Both the diversification and importance of agriculture are well indicated by the rank of Maury County among the counties of the state in thirteen major agricultural products in 1948. The county had the following rank among the Tennessee counties: rye and oats, first; barley, second; hay, cattle, and sheep, fourth; tobacco, wheat, and milk cows, fifth; mules, hogs and chickens, seventh; and corn, tenth.

Tennessee ranks second among the states in the production of phosphate, exceeded only by Florida. Peak production in the state was reached in 1947 when 1,500,000 long tons were mined. The commercially important deposits of phosphate rock occur in Middle Tennessee with the bulk of the mineral found in Maury County and the adjacent counties of Giles and Williamson. Phosphate Mining and processing center around Mt. Pleasant and Columbia. The chief products are: super-phosphates and raw ground rock for fertilizers, and elemental phosphorus. Eight major companies are engaged in this industry within the county, employing approximately 2,300 people.

A total of 2,953 acres have been mined. The present method of reclamation is to plant cover crops on the areas as soon as the companies are through

mining. This conserves moisture and eliminates erosion. It is difficult to estimate the phosphate reserves because much of the area has not been mapped and prospected. It is believed that the estimated reserve of 96,918,300 long tons in 1940 is sufficient to maintain the industry for a hundred years or more with improved methods of mining and recovery.

The farms of the Inner Basin and the Highland Rim areas are too small to maintain a standard of living comparable to that enjoyed by the farmers of the Outer Basin. A decrease in number and increase in size of these farms of less productive soils would permit more effective farm units; improved farm machinery would be more feasible; larger herds of cattle and flocks of sheep could be tended on each farm unit, thus utilizing the time of the operator in a more efficient manner. Such a program would require provisions to earn a livelihood for those people who would be displaced from the farm.

A very thorough survey of land-use capabilities would contribute greatly to those engaged in planning the county's future. Certainly much of the area should be replanted to trees with commercial value, and other areas should be farmed only on a limited scale to prevent excessive soil erosion.

With an abundant supply of fresh water, access to unlimited hydroelectric power from nearby TVA establishments, good transportation facilities, and an excessive rural population which is tending to turn to industry for a livelihood, Maury County should be attractive to many additional industries in the future.

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