

U. S. DEPARTMENT OF AGRICULTURE,  
BUREAU OF SOILS—MILTON WHITNEY, Chief.

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SOIL SURVEY OF LAWRENCE COUNTY,  
TENNESSEE.

BY

CHARLES N. MOONEY AND O. L. AYRS.

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[Advance Sheets—Field Operations of the Bureau of Soils, 1904.]



WASHINGTON:  
GOVERNMENT PRINTING OFFICE.  
1905.

[PUBLIC RESOLUTION—No. 9.]

JOINT RESOLUTION Amending public resolution numbered eight, Fifty-sixth Congress, second session, approved February twenty-third, nineteen hundred and one, "providing for the printing annually of the report on field operations of the Division of Soils, Department of Agriculture."

*Resolved by the Senate and House of Representatives of the United States of America in Congress assembled,* That public resolution numbered eight, Fifty-sixth Congress, second session, approved February twenty-third, nineteen hundred and one, be amended by striking out all after the resolving clause and inserting in lieu thereof the following:

That there shall be printed ten thousand five hundred copies of the report on field operations of the Division of Soils, Department of Agriculture, of which one thousand five hundred copies shall be for the use of the Senate, three thousand copies for the use of the House of Representatives, and six thousand copies for the use of the Department of Agriculture: *Provided,* That in addition to the number of copies above provided for there shall be printed, as soon as the manuscript can be prepared, with the necessary maps and illustrations to accompany it, a report on each area surveyed, in the form of advance sheets, bound in paper covers, of which five hundred copies shall be for the use of each Senator from the State, two thousand copies for the use of each Representative for the Congressional district or districts in which the survey is made, and one thousand copies for the use of the Department of Agriculture.

Approved, March 14, 1904.

[On July 1, 1901, the Division of Soils was reorganized as the Bureau of Soils.]

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### MAP.

Soil map, Lawrence County sheet, Tennessee.



# SOIL SURVEY OF LAWRENCE COUNTY, TENNESSEE.

By CHARLES N. MOONEY and O. L. AYRS.

## LOCATION AND BOUNDARIES OF THE AREA.

Lawrence County is situated in middle Tennessee, being one of the lower tier counties, and bordering on Alabama. The latitude of its southern boundary is that of the Tennessee-Alabama State line, which is approximately 35° north. It is bounded on the south by Lauderdale County, Ala., on the east by Giles County, on the north by Maury and Lewis counties, and on the west by Wayne County, Tenn. The area contains 395,456 acres, or, approximately, 618 square miles.

Lawrenceburg, with a population of about 2,000 and located near the center of the county, is the county seat. Other towns of some importance are Westpoint, Iron City, St. Joseph, Loretto, Wayne Station, and Summertown, all being situated along the Louisville and Nashville Railroad, which passes through the county in a general north-easterly direction.

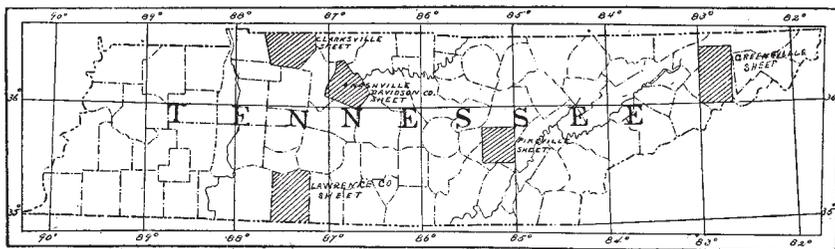


FIG. 1.—Sketch map showing location of the Lawrence County area, Tennessee.

## HISTORY OF SETTLEMENT AND AGRICULTURAL DEVELOPMENT.

That part of Tennessee in which Lawrence County is situated was purchased from the Cherokee Indians by the United States Government in 1806. Some of this territory became known as the "Congressional reservation," and in the act of Congress establishing it the State of Tennessee was authorized to issue grants and perfect titles to certain lands within the territory.

It was not until 1815 that a white settlement took place within the region afterwards included in Lawrence County, and this is said to have been on Big Buffalo Creek, opposite to what is now the

town of Henryville. These settlers were from North Carolina, as were many of those who subsequently came to this part of the State, and two years later another settlement was begun at Lawrenceburg. In 1817 Lawrence County was established by an act of the general assembly, but its actual organization was not completed until 1818, when the county court was organized. The county was cut off from "the territory south of Maury and west of Giles," and embraced a much larger area than now, reductions having been made from time to time.

The settlers located near springs, and the surrounding lands were always entered first. Military grants for services performed were given, and also occupants' grants. By 1850 small settlements were scattered over much of the county, extending along the larger stream courses where the lands were more productive. The streams abounded with fish, which formed an important part of the food of the people. These streams also furnished power to run their mills and other machinery, and, in the absence of roads, furnished outlets to other parts of the county.

Wild game was plentiful, and the pioneers subsisted largely by hunting. Small crops were produced, the principal product being corn, which has always been the leading crop of the county. Wheat was introduced at an early day, and tobacco was also grown for home consumption. Cotton was cultivated some time before the invention of the gin, being spun and woven into cloth by the women and by hand. As early as 1817 a cotton gin was built on one of the creeks and run by water power. In 1852 a cotton factory, run by the same power, was built and the building and operation of many others soon followed. Besides making threads and yarns, cloth also was woven. The raw product used in these factories, however, was not all grown in the immediate section, but was transported by wagon either from the Tennessee River or from the railroad in Giles County, the wagons hauling the raw material to the mills and returning with the finished products. These factories continued in operation until a few years ago, when, on account of inadequate transportation, it was found impracticable to compete in the markets with other manufacturing sections. Cotton is still grown to a limited extent in the southern part of the county.

In 1870 the German Catholic Homestead Association, organized in Cincinnati, Ohio, bought about 25,000 acres of land, mostly in the south central part of the county, which was disposed of in small farms, and at a nominal price, to those members of the association who desired to become settlers. This association brought in a good many families, and the thriving towns of Loretto and St. Joseph were built up by them. They settled upon the level uplands known as the "barrens," which, by the older settlers, were considered too poor

to cultivate, but these people by their industry and thrift have made progress and are doing well. Small German settlements are now scattered over the county. Northern people are now coming in and buying these level uplands, preferring the land to their own in the North, being attracted also by the mild and desirable climate. The newcomers settle on the more level and poorer lands along the railroad, while the older settlers continue to occupy the creek bottoms. The broken and hilly lands in the remote parts of the county are still a wilderness.

Before the building of any railroad the transportation was entirely by wagon, and the markets and shipping points were at different places on the Tennessee River, the products being conveyed to other markets by boats. The first road constructed in this county was the Natchez "Trace," permission being given by treaty with the Indians in 1806. The road extended from Nashville to Natchez, Miss., and passed across the northwestern part of the county. Other roads were soon constructed through the county, the most notable one being the "Old Military road," put through by General Jackson between Nashville and New Orleans. It passes through the county near its center from north to south. These roads followed the ridges and were well made for the times, and have always been important highways, not only in the immediate section, but as outlets to other sections of the country.

About 1880 a branch line of the Louisville and Nashville Railroad was built from Columbia to Lawrenceburg, and in a short time extended to Florence, Ala. This railroad has been an important factor in opening up the valuable timber resources of the county and also in fostering agriculture near the towns along its route.

#### CLIMATE.

The appended table, compiled from records of the Weather Bureau stations at Iron City, Lynnville, and Waynesboro, gives the normal monthly and annual temperature and precipitation.

Iron City is situated in the southern part of the county, Waynesboro is in the county to the west, and Lynnville is in the county north of Lawrence. The data from these places are believed to represent fairly well the local climatic conditions in the intervening territory.

Lawrence County, being located on the Highland Rim, at an elevation of about 1,000 feet above sea level, has a very desirable climate, unmarked by great extremes of heat or cold. The winters are mild and practically without snow, even though farther south in adjoining States quite heavy snowfalls are sometimes reported. The ground is rarely frozen for more than an inch or two. The elevation of the uplands insures good air drainage, and late spring and early fall frosts are not of common occurrence.

The average annual precipitation for the three stations named is about 53 inches. This, as will be seen from the table, is fairly well distributed. However, the greatest rainfall is during the winter months, and during the last few seasons droughts have occurred in the early part of the growing season and also in the early fall.

*Normal monthly and annual temperature and precipitation.*

Month.	Iron City.		Lynnville.		Waynesboro.	
	Temper- ature.	Precipi- tation.	Temper- ature.	Precipi- tation.	Temper- ature.	Precipi- tation.
	°F.	Inches.	°F.	Inches.	°F.	Inches.
January .....	40.1	5.67	38.8	5.27	38.5	4.76
February .....	39.6	4.36	40.7	5.54	40.8	4.66
March .....	51.1	8.40	48.9	6.40	49.4	6.26
April .....	58.8	5.78	58.5	4.99	58.7	3.87
May .....	68.5	2.54	68.5	4.05	67.0	3.06
June .....	75.5	5.80	76.0	4.04	75.4	4.12
July .....	79.4	2.82	78.9	5.50	78.2	4.50
August .....	78.2	4.98	77.5	4.27	76.7	4.22
September .....	71.8	3.40	70.5	3.64	70.0	3.16
October .....	61.6	2.38	60.2	2.37	58.8	1.91
November .....	50.0	4.25	48.8	3.63	48.2	3.60
December .....	40.6	6.28	41.3	4.61	40.9	4.14
Year .....	59.6	56.66	59.1	54.31	58.6	48.26

PHYSIOGRAPHY AND GEOLOGY.

The Highland Rim forms one of the physiographic divisions of the State, consisting of an upland region encompassing what is known as the Central Basin, a region lying at an elevation about 400 or 500 feet lower. The rim consists of a much dissected plateau whose general elevation is about 1,000 feet above sea level. Lawrence County is situated on its crest, the highest point being in the vicinity of Wayne, where the elevation is about 1,200 feet. To the north and south of this place the elevation decreases, and at the Alabama line is about 400 feet less. The streams have a rapid fall, Shoal Creek falling over 500 feet in its course through the county.

The topographic features of the county may be considered in three divisions—the broad uplands or plateau proper, the hills, and the terraces and bottoms along the larger streams. The uplands have a level to gently rolling topography and form the main stream divides, being more extensive in the north-central part of the county, where the streams head. These level uplands are known by the general names of “flat woods” or “barrens,” the latter term having been applied because of a supposed infertility of the soils found in that section. As a rule the drainage is poor, and during the winter rains the lower lying areas are covered with water and become more or less swampy. About three-fourths of the surface of Lawrence County is

hilly, consisting of narrow, irregularly shaped ridges with steep slopes to narrow valleys some 200 feet or more below. Near the heads of the streams the topography is only gently rolling, but farther down it becomes more rugged and extends back farther from the streams. The western and southern parts of the county are the more rugged, and considerable areas are so steep and stony that cultivation is either extremely difficult or impossible. Along the larger streams precipitous bluffs 100 feet or more in height occur. The bottoms and terraces along the larger streams are not extensive in this county, but outside of the area they become more extensive and important. Their occurrence is in the horseshoe bends and the longer inner curves of the streams, and they rarely occupy both sides of the streams, as usually on the outer curve the current swings into the bluffs. Often the first bottoms are entirely wanting. Such areas, however, generally consist of narrow first bottoms, from which rise gently rolling terraces or slopes, back of which the steeper slopes of the hills appear. They are, therefore, not the characteristic flat terraces found along most streams. Their formation, however, has been due to stream action and sedimentation, but probably at a time when the land was slowly rising or stationary for only short periods. The streams are still cutting their channels, and flood plains are not being developed. These terraces are spoken of collectively as "bottoms," though only a small proportion of them is subject to overflow.

The rock formations are all of sedimentary origin, and belong to the St. Louis group of limestones of Lower Carboniferous age. They consist of blue to gray, more or less siliceous limestones, with bands of chert, siliceous shales, and fine-grained sandstones. These strata are horizontal or nearly so, and outcrops are seen only along roadcuts and streams, although varying quantities of rock fragments occur on the surface and the proportion increases with depth until the fresh rock is encountered 10 feet or more beneath the surface.

The rock is more or less decomposed, the calcareous matter having been removed by solution, leaving behind the difficultly soluble siliceous matter. The chert consists of small angular fragments, while larger blocks of siliceous limestone are found, both occurring together and in varying quantities. The cherty material makes excellent road metal, and is used to some extent for that purpose. A narrow strip of phosphatic limestone extends through the county from north to south, passing near Springers Station; but it has no influence on the soils and has not proved of any value otherwise, being as yet undeveloped. In the western part of the county are several iron-ore deposits which are being mined. The ore occurs in layers on or near the surface. The iron-ore banks are said by geologists to mark the location of old bogs, in which mineral from the decomposing lime-

stones was deposited. The ores promise to be of great commercial importance to the county, but as yet the industry has not been fully developed.

The drainage of Lawrence County is afforded by several streams, all having their source practically within the limits of the county and finally emptying into the Tennessee River. Sugar and Shoal creeks drain about three-fourths of the county, the former leaving the county at the southeast corner and the latter at the southwest corner. Between these creeks are Bluewater and Second creeks, which drain the central-southern part of the county. The northwestern part is drained by Buffalo Creek, and a portion of the northeast by Wet and Dry Weakley creeks, which flow over into Giles County. These are all rapid flowing streams fed by numerous springs along their courses. They are broad and shallow, flowing over rocky floors, and in their upper courses descend from one strata of rock to another, forming small falls, many of which are several feet in height.

#### SOILS.

The rock formations of Lawrence County do not give rise to a great variety of soils, and only four types have been recognized, the classification being made upon textural differences in the soil and subsoil. The name and actual and relative extent of each type are given in the following table:

*Area of different soils.*

Soil.	Acres.	Per cent.
Clarksville stony loam .....	263, 296	66.6
Clarksville silt loam .....	113, 664	28.8
Clarksville clay loam .....	10, 880	2.8
Clarksville loam .....	7, 616	1.8
Total .....	395, 456	-----

#### CLARKSVILLE CLAY LOAM.

The soil of the Clarksville clay loam has an average depth of about 12 inches, and varies from a dark-brown to a reddish-brown loam or silty loam. The subsoil consists of material somewhat similar to the soil, but more compact and of a dark-red color, grading into a silty clay loam, which becomes stiffer in the lower depths. In depth the subsoil exceeds 36 inches, as shown by sections exposed in road cuts and wells. The underlying rock is nowhere exposed, but occasionally some siliceous rock fragments are found on the surface and in the soil and subsoil. Where this type comes in contact with the Clarksville silt loam, and in some other localities, a lighter phase

occurs. In such places the color of the soil is somewhat lighter, but the red, heavy silt clay subsoil is found, as in typical areas.

The Clarksville clay loam is limited practically to the central part of the county, in the vicinity of Lawrenceburg and Wayne Station. There are three principal areas—one at Lawrenceburg, another to the south and west of Wayne Station, and a third, a strip about three-fourths of a mile wide, on the west side of Crowson Creek. A small area occurs near Henryville and two smaller ones in the southern part of the county.

The type is an upland soil occurring on the main stream divide. The surface varies from gently rolling to nearly level, and shallow basinlike depressions are sometimes found within the areas. The higher lying or gently rolling lands have fair surface drainage, but the more level areas are not well drained, and drainage is assisted by the use of open furrows. Underdrainage would prove very beneficial to this soil. The close texture of the subsoil makes the type retentive of moisture, and with proper methods of cultivation crops do not suffer from drought.

The Clarksville clay loam is a residual soil derived from the weathering of siliceous limestones. These have weathered deeply and uniformly, so that the soil formation is deep and the surface smooth and only gently rolling.

The Clarksville clay loam is recognized as the best soil in the county for general farming, and all of the type has been cleared and is under cultivation. Formerly, and particularly before the civil war, this land was devoted to cotton, and its continued cultivation to that crop greatly impoverished much of it. However, the once "worn-out" farms have been largely reclaimed by good methods of cultivation and are now quite productive.

The Clarksville clay loam is an easily worked soil, does not clod badly, and on the whole is friable and loose. The close-textured subsoil makes it retentive of fertilizer and moisture, so that with proper methods of cultivation the type responds readily and crops do not suffer from droughts in ordinary seasons. It is the best wheat soil in the county, producing on an average 15 bushels per acre, with maximum yields of 25 bushels or more for single fields not uncommon. Both winter and spring oats do well, and on some farms large crops of clover hay are obtained. Corn yields from 25 to 60 bushels to the acre. Cowpeas thrive, and it is a common practice to grow a crop of peas after the wheat is harvested, thus producing two crops in one season. The cowpeas prove very beneficial to the soil, and are employed very generally in maintaining and increasing its productivity.

The Clarksville clay loam is claimed to be especially adapted to strawberries and cantaloupes. The strawberries grown are the Klou-

dike and Gandy. The cantaloupes produced on this soil, as well as the strawberries, are said to be of superior quality.

The best improved farms are located in this type of soil, and range in value from \$20 to \$50 an acre; but little, if any, land of this type is on the market.

The mechanical analyses of typical samples of the fine earth of the soil and subsoil of the Clarksville clay loam are given in the following table:

*Mechanical analyses of Clarksville clay loam.*

No.	Locality.	Description.	Fine gravel, 2 to 1	Coarse sand, 1 to 0.5	Medium sand, 0.5 to 0.25	Fine sand, 0.25 to 0.1	Very fine sand, 0.1 to 0.05	Silt, 0.05 to 0.005	Clay, 0.005 to 0
			mm.	mm.	mm.	mm.	mm.	mm.	mm.
			<i>P. ct.</i>	<i>P. ct.</i>	<i>P. ct.</i>	<i>P. ct.</i>	<i>P. ct.</i>	<i>P. ct.</i>	<i>P. ct.</i>
12234	3 miles NW. of Lawrenceburg.	Brown silty loam, 0 to 12 inches.	0.9	3.7	2.9	6.6	3.3	64.1	18.1
12236	1 mile E. of Lawrenceburg.	Brown silty loam, 0 to 12 inches.	.1	1.1	.9	3.2	2.6	67.9	23.8
12235	Subsoil of 12234 .....	Silty clay loam, 12 to 36 inches.	.5	2.2	1.4	4.2	2.0	57.7	31.4
12237	Subsoil of 12236 .....	Silty clay, 12 to 36 inches.	.5	1.3	.6	2.0	1.6	58.4	35.3

CLARKSVILLE SILT LOAM.

The soil of the Clarksville silt loam, to an average depth of 10 inches, consists of a compact silt loam of gray, yellowish, or light-brown color, containing an appreciable amount of fine sand. In some locations the soil is much sandier and the grades of sand coarser. The latter is true of the higher-lying areas, and of areas bordering the Clarksville stony loam, while in the lower situations and basin-shaped depressions the maximum silt content is found. The soil has an ashy appearance and feel, and is sometimes spoken of as "white land," though the term "barrens" is a more common local name.

The subsoil is of similar texture to the soil, somewhat more compact and possibly a little heavier, becoming more silty and clayey in the lower depths. The color is yellow, sometimes reddish yellow, and in some places grades into a red, in which case the material is generally heavier and more clayey. From a foot to 2 or more feet below the surface the subsoil often becomes so compact that it is spoken of as "hardpan," although it can not be considered a true hardpan, as there is probably no cementing material, the compactness being due to the close arrangement of the particles, the clay filling in the interstices between the larger silt particles. On the tops and slopes of

small ridges the subsoil sometimes rests upon the underlying rock at depths of 3 feet or less, but as a rule the depth of the soil formation is 10 feet or more. In the lower depths are found fragments and boulders of siliceous rock more or less disintegrated and decomposed.

The Clarksville silt loam is one of the extensive soil types of the county, embracing large and irregularly shaped areas that follow the contour of the level upland or main stream divides. The most extensive development of this soil is north and west of Lawrenceburg, but it extends also southward between Shoal, Bluewater, and Sugar creeks.

The type occupies the greater part of the plateau and ridgy divides. The surface is nearly level to gently rolling, and at the heads of streams shallow basinlike depressions occur. Small ridges rising but a few feet above the general level are found. Because of the generally flat character of the surface the broad areas are known as "flat woods."

The Clarksville silt loam is a residual soil, derived from the breaking down of the siliceous limestone, the calcareous matter from which has been removed by solution and the siliceous matter left behind, gradually disintegrating and weathering to form the soil. Thin beds of very fine grained sandstone have also probably entered into the formation of this soil. As a rule no rock fragments are found in the surface 3 feet, although in some of the higher locations, as also where the type borders the Clarksville stony loam, there are enough fragments present to make the soil stony, and here the type may be considered a transitional phase between this soil and the Clarksville stony loam. At depths below 3 feet the quantity increases until the solid rock is encountered.

The usually level surface, the general compactness of the subsoil, and the presence of the more or less impervious "hardpan" stratum, do not favor either surface or subsurface drainage. Consequently on the more level areas water stands during wet seasons, and swampy conditions prevail temporarily. These portions are known as "slashes," and the characteristic timber growth is gum, willow oak, and post oak, the latter growing to large size. The Clarksville silt loam has always been considered too poor a soil to cultivate, and hence has remained in forest, and little or no attempt has been made to drain the wet areas. These lands no doubt would be generally benefited by tile underdrainage, and it is said that the moisture conditions are greatly improved by simply subsoiling as deep as possible. During a dry season the land becomes very dry and crops suffer even during short periods of dry weather.

With the exception of the "barrens" in the vicinity of Loretto and St. Joseph, only in recent years has a beginning been made to clear and put these lands under cultivation. The natural forest

growth consists of chestnut, gum, and different varieties of oak, the white oak predominating. The scrub oak is usually found on the higher and poorer parts, while the willow, oak, and gum occupy the wetter portions. The value of the "barrens" in the past has been based entirely upon the timber that could be obtained. Where the heavier growth has been removed broomsedge and many species of wild legumes, the vetches predominating, furnish pasturage for live stock. These areas are all open and the live stock are allowed to range at will.

Where the land is cultivated the crops are wheat, corn, and cowpeas. This soil is considered better for wheat than the hilly land, principally on account of easier cultivation and harvesting, as improved machinery may be used. With ordinary cultivation and small applications of fertilizer, wheat yields about 8 or 10 bushels per acre, but yields as high as 20 bushels or more have been obtained with good methods. The soil is too susceptible to drought as a rule for corn to do well, the yields ranging from 10 to 20 bushels per acre. Another difficulty in growing corn is in getting it planted early enough, owing to the wet condition of the soil in the spring. This difficulty applies also to other spring-sown crops. This trouble could be removed by tile drainage, and something could be gained as well by preparing the land in the fall.

Cowpeas flourish on this soil, and are quite generally grown and cut for hay. The crop is known to be beneficial to the soil, although where hay is made too much of the crop is removed from the fields. It would be well if a crop like rye could be grown during the winter and turned under for green manure in the spring. This would greatly improve the tilth of the soil as well as furnish some plant food for the succeeding crop.

Garden truck and small fruits do well. Tomatoes grow to a good size and are of superior quality. Some of this land is especially adapted to sweet potatoes, in one notable instance a yield of 400 bushels to the acre having been secured. The average yield, however, is 200 bushels or less. The product finds a ready market, and a larger acreage devoted to the crop would prove profitable. Irish potatoes do not do so well, as the soil becomes too compact for them. This, however, might be obviated by the use of coarse littery stable manure and green manure, which have a tendency to keep the soil more friable and open structured. Turnips succeed exceptionally well, and for the limited quantity now produced good prices are obtained. Strawberries and cantaloupes do well on this soil and are promising industries. With these industries well developed the "barrens" will become in greater demand. These lands are being taken up now by northern settlers, some of whom are making improvements by drainage and introducing modern methods of cultivation for special

crops. The soil can be easily improved, as has already been done in a few instances. The farms are large, usually exceeding 200 acres. This land brings from \$2 to \$10 an acre, the latter price being paid for that which is partly cleared and located near the railroad.

The mechanical analyses of typical samples of the Clarksville silt loam are given in the following table:

*Mechanical analyses of Clarksville silt loam.*

No.	Locality.	Description.	Fine gravel, 2 to 1	Coarse sand, 1 to 0.5	Medium sand, 0.5 to	Fine sand, 0.25 to 0.1	Very fine sand, 0.1 to	Silt, 0.06 to 0.005 mm.	Clay, 0.005 to 0 mm.
			mm.	mm.	0.25 mm.	mm.	0.06 mm.		
			<i>P. ct.</i>	<i>P. ct.</i>	<i>P. ct.</i>	<i>P. ct.</i>	<i>P. ct.</i>	<i>P. ct.</i>	<i>P. ct.</i>
12228	½ mile NW. of Crestview.	Silty loam, 0 to 12 inches.	0.2	1.8	1.5	4.3	2.5	67.5	22.1
12230	4 miles SW. of Appleton.	Heavy silty loam, 0 to 8 inches.	.6	1.5	.8	3.1	2.1	64.6	27.2
12229	Subsoil of 12228 .....	Silty loam, 12 to 36 inches.	.7	2.1	1.7	4.1	1.6	64.9	24.9
12231	Subsoil of 12230 .....	Silty clay loam, 8 to 36 inches.	1.6	1.4	.6	2.9	1.9	60.4	31.0

CLARKSVILLE STONY LOAM.

The soil of the Clarksville stony loam consists of a gray to brown loam, with usually a high silt content, but varying considerably in respect to this component, with differences in topographic position. On the higher elevations and slopes the soil is more sandy, while lower down it is more silty and loamy, becoming at times a silt loam, or at others a light loam. In places where erosion is not active organic matter is usually present in sufficient quantities to give the soil the appearance of a loam of dark color. The average depth of the soil is about 8 inches, and the depth varies little from this average. When dry the material has an ashy texture and feel.

The subsoil is silty clay loam, somewhat heavier in texture than the soil, the silt and clay content usually increasing in the lower depths. The color of the subsoil is generally yellow, but ranges through reddish yellow to red. The latter two, as a rule, are heavier than the yellow subsoil, the red often becoming a silty clay loam. The subsoil rarely exceeds 24 inches in depth and usually rests upon broken and more or less decomposed rocks. Upon the surface occurs from 10 to 60 per cent of angular rock fragments, varying in size from small gravel to blocks several inches in thickness. These consist of chert and parts of the siliceous limestones, fine-grained sandstones, and sandy shale, and occur also in the soil and subsoil, increasing in quantity with depth.

The Clarksville stony loam has a wider distribution than any of the other soil types of Lawrence County. It occurs in all parts of the county and in large areas, its greatest development being in the western and southern parts. It occupies all the hilly areas of the county and the slopes of the divides along the stream courses. The slopes, as a rule, are steep and difficult to cultivate. The rough topography of the type and its stony character insure good drainage.

The Clarksville stony loam is a residual soil, derived from the weathering of the underlying rocks, which consist of siliceous limestones with beds of chert, thin beds of fine-grained sandstone, and fine sandy shales. The calcareous matter in the rocks has been removed by solution, leaving the siliceous matter, which by disintegration forms the soil. The more resistant parts of the rocks and the chert are left as fragments upon the surface and in the soil and subsoil.

This type of soil is still largely in forest, the natural growth comprising various kinds of oak. In the higher situations, where the soil is shallower, the growth is mainly scrub oak, but lower down on the slopes, and particularly in the ravines, the timber is much heavier, consisting of chestnut, poplar, walnut, butternut, hickory, and different kinds of oak.

When the land is cleared it is devoted mainly to corn, which is the easiest crop to grow on the steep and stony hillsides, the yields varying from 15 to 35 bushels per acre. No crop rotation is followed and when the land becomes exhausted new land is taken up for cultivation. The new land produces good crops for about five seasons, after which time without the use of manure or fertilizer the yields decrease rapidly.

The Clarksville stony loam has always been recognized as a more desirable soil, even if more difficult to cultivate, than the "barrens" (Clarksville silt loam), as heretofore described. It is well adapted to corn, and good yields are generally obtained where the land has not been cultivated too long. The lower slopes are the more productive, the soil being more loamy, and the moisture conditions better. A difference is recognized in the exposure of the slopes, the northern being preferred. Clover does well on the northern exposures, but is grown by only a few farmers. Cowpeas have a thrifty growth and are quite generally grown. The greater part of this land is too steep and stony to be adapted to wheat, and practically none is produced except on the better locations, where fair yields are secured. Small fruits and garden vegetables do well. Some peaches of good quality are produced, and it is thought that apple orchards would do well, as the soil conditions seem to favor the growing of this particular fruit. A few new orchards have been set out.

The value of the Clarksville stony loam is determined largely by the character of its timber growth, the price ranging from \$1 to \$10 an acre.

The mechanical analyses of typical samples of the fine earth of both soil and subsoil are given in the following table:

*Mechanical analyses of Clarksville stony loam.*

No.	Locality.	Description.	Fine gravel, 2 to 1 mm.		Coarse sand, 1 to 0.5 mm.		Medium sand, 0.5 to 0.25 mm.		Fine sand, 0.25 to 0.1 mm.		Very fine sand, 0.1 to 0.05 mm.		Silt, 0.05 to 0.005 mm.		Clay, 0.005 to 0 mm.	
			P. ct.	P. ct.	P. ct.	P. ct.	P. ct.	P. ct.	P. ct.	P. ct.	P. ct.	P. ct.				
12240	9½ miles W. of Lawrenceburg.	Loam, 0 to 8 inches.....	1.2	5.4	5.1	10.3	3.8	53.3	20.9							
12238	1 mile NW. of West-point.	Silty loam to loam, 0 to 8 inches.	8.1	6.3	1.6	2.5	1.6	53.7	25.6							
12241	Subsoil of 12240.....	Silty loam, 8 to 26 inches.	2.5	3.9	3.9	8.6	2.3	50.8	27.9							
12239	Subsoil of 12238.....	Silty clay loam, 8 to 24 inches.	5.5	4.9	1.2	2.0	1.4	52.9	32.1							

#### CLARKSVILLE LOAM.

The soil of the Clarksville loam, to an average depth of 12 inches, usually consists of a brown silty loam or loam. The subsoil is similar in texture to the soil and of a yellowish to light-brown color, but is more compact than the soil and increases in silt and clay content in the lower depths, becoming in some places a silty clay loam. At a depth of about 2 feet or more a stratum of broken rock fragments is usually found. These fragments are usually cherty and small and occur on the surface and in the soil and subsoil in sufficient quantity to give the type a gravelly character, the amount of rock fragments often equaling that contained in the Clarksville stony loam, in which case the boundary between the two types is arbitrarily drawn. This soil could be considered as a phase of the Clarksville stony loam, as it is largely derived from the latter; but because of its position and higher agricultural value it has been classified as a separate type. It is somewhat variable and often contains enough fine sand to give it the character of a fine sandy loam.

The Clarksville loam occupies areas locally called "bottoms," which usually consist of a narrow first bottom and a gently rolling terrace, extending back some distance to the steeper slopes of the hills. Its highest part does not exceed 50 feet above the stream beds. Sometimes the first bottoms are wanting, especially along the smaller streams, in which case the terrace starts from the streams. Farther

down the streams and out of the county the bottoms are more extensive. The best development is in the large bends of the streams and on the inner side of the long curves. Rarely do the terraces occur on both sides of the stream at the same point.

The Clarksville loam is of limited extent in this county, the largest areas occurring along Shoal Creek and its main tributaries. There are also considerable areas along Sugar and Buffalo creeks, while along all the streams narrow strips occur, many of them too small to be shown on a map of the scale used.

This type is sedimentary in origin, consisting of the wash from the adjacent higher slopes, together with material deposited from the streams in times past. All the material has been reworked by stream action, and assortment has taken place to some extent, as shown by strata of rock fragments found in the finer material.

The Clarksville loam has always been considered very desirable land for general farming. The bottoms were the first lands to be cleared, and many of the fields have been under cultivation ever since the settlement of the county. Good moisture conditions usually prevail, and crops rarely suffer during droughts. Corn has always been the principal crop, and the yields range from 20 to 60 bushels or more per acre, the largest yields being obtained on the lower and better portions. Wheat, oats, and rye also do well, the yield ranging from 10 to 25 bushels per acre. Clover thrives and some very large crops of hay are secured, and with the prices obtained this is a very profitable crop, and one which should be grown more generally. Cowpeas produce large crops. Grasses will also grow well, furnishing good pasturage as well as hay. The cotton produced in Lawrence County is grown mostly upon this soil, yielding as much as one-half bale to the acre.

Crop rotation is not generally practiced, but on a few of the better farms a rotation of corn, wheat, and clover or cowpeas is followed. Fertilizer is not generally used on this soil. Subsoiling has been practiced to some extent and has proved beneficial. Some of these bottom lands are valued as high as \$75 an acre. Usually, however, the bottoms are included in farms, of which the uplands form a part, and the average price of both is much lower than is the case when the bottoms are taken separately.

The mechanical analyses of samples of the fine earth of the soil and subsoil of the Clarksville loam are given in the table following.

*Mechanical analyses of Clarksville loam.*

No.	Locality.	Description.	Fine gravel, 2 to 1 mm.	Course sand, 1 to 0.5 mm.	Medium sand, 0.5 to 0.25 mm.	Fine sand, 0.25 to 0.1 mm.	Very fine sand, 0.1 to 0.05 mm.	Silt, 0.05 to 0.005 mm.	Clay, 0.005 to 0 mm.
			P. ct.	P. ct.	P. ct.	P. ct.	P. ct.	P. ct.	P. ct.
12242	4 miles W. of Henryville.	Brown silty loam, 0 to 10 inches.	1.2	3.2	2.9	4.0	1.2	64.2	23.3
12244	4 miles E. of Pinkney	Brown silty clay loam, 0 to 12 inches.	1.0	2.7	1.2	2.4	2.5	59.8	30.3
12243	Subsoil of 12242 .....	Brown silty loam, 12 to 24 inches.	1.1	2.7	2.2	3.6	1.4	62.6	26.2
12245	Subsoil of 12244 .....	Brown silty clay loam, 12 to 30 inches.	1.0	1.4	.7	1.9	2.2	59.9	32.6

## AGRICULTURAL CONDITIONS.

Lawrence County is still largely forested, it being estimated that not more than one-fourth of the land of the county is cleared and under cultivation. Therefore interest is centered largely in the forest products. The income from the different lumbering industries reaches several hundred thousand dollars annually, and the work of getting out the timber and operating the mills gives employment to a large proportion of the people. In fact, nearly all the inhabitants are more or less engaged in this work. It is only since the building of the railroad that it has been possible to exploit the forest resources of the county, and prior to 1880 both the land and timber had little money value. The forest growth is fairly heavy, and consists of different varieties of oak, the white and post oak predominating, and chestnut, with some poplar, walnut, and hickory.

The cleared lands, which, as heretofore stated, occupy about one-fourth of the area of the county, have until recently been limited to the bottoms and terraces along the creeks and the slopes of the adjacent hills, which represent the more productive soils and better locations in the county. Farming operations, therefore, have not yet become extensive in Lawrence County. The average size of the farms, according to the Twelfth Census, is 127.2 acres. The holdings of timbered lands are much larger, there being some tracts of several thousands of acres. The size of the farms is steadily decreasing with the influx of new settlers, who buy small bodies of land. Of the total acreage in farms only about one-third is improved. The dwellings are small and plainly constructed plank houses, although there are a few modern houses only recently built.

The outbuildings are small and few, and, in general, no provision is made for housing live stock, with the exception of horses. The

common worm rail fence incloses the cultivated fields. On some of the wooded lands where the timber growth is not very thick, particularly on the Clarksville silt loam, or "barrens," there is a growth of broomsedge which is said to afford a fair pasturage for stock, especially in the early spring.

According to the last census 64 per cent of the farms are operated by the owners. Where farms are rented it is on a share basis, a certain portion of the crops produced going to the owners. There is very little labor hired on the farms. As a rule the labor is efficient and the wages paid are reasonable.

Until the past year agriculture has been mainly confined to the production of the staple crops—corn, wheat, and some cotton—together with certain vegetable crops needed for home consumption. As there is no diversity in the soils there has been a consequent lack of diversity in crops. The lands cultivated being more or less steep or stony, those crops have been grown which could be cultivated with the least difficulty.

Corn succeeds better than any of the other farm crops. It can be grown on the steep stony hillsides with an assurance of a crop of some kind. The average yield for the county is about 20 bushels per acre, although as high as 60 bushels per acre is not uncommon on the Clarksville clay loam. Corn makes a very rank growth, producing a large quantity of fodder. The general method of harvesting is to strip the leaves and later snap off the ears, storing with the husks on and husking the corn as needed. Some of the settlers from the north follow the northern method of cutting and shocking the fodder. On some of the best farms corn harvesters, huskers, and shredders are now in use. The acreage in corn is nearly double that of all the other crops combined.

Wheat is the crop of next importance to corn. The yield as a rule is not large, although on some of the bottoms and level uplands yields ranging from 20 to 30 bushels per acre are reported. The rugged stony lands are not suitable for wheat, because of the difficulty in planting and harvesting.

The acreage in oats is increasing and cowpeas are grown on nearly every farm. The crop is cut for hay, which forms practically the only kind of hay produced in the county. Clover does well on all the soils except the "barrens." On the Clarksville stony loam it does best on the hill slopes with northern exposures. This crop should be more generally grown and given a place in a crop rotation.

Some cotton is grown in the southern part of the county, but the growing season is hardly long enough and the soils are considered too thin for its profitable production. There is a tendency, however, to a revival of cotton growing, because of the expectation of higher prices owing to decreased production of cotton on account of the

ravages of the boll weevil elsewhere, the insect not having yet appeared in this section of the State. Some effort is being put forth to introduce tobacco growing. A cigar filler leaf has been produced, but its quality is in question and it is not thought likely that tobacco of this type would prove a profitable crop on these soils.

As stated elsewhere in this report, the Irish potato does not succeed in Lawrence County soils, but the sweet potatoes produced are of excellent quality, and their production should be increased. Good prices are obtained for the small shipments made, a few carloads being sent annually from Summertown. A yield of more than 400 bushels per acre has been reported, and with proper methods of cultivation the average yield should be not less than 200 bushels.

Tomatoes of a superior quality are profitably grown. A canning factory has been established, and it is probable this industry may be developed. The vegetables produced on the Clarksville silt loam find good market at the iron mines within the county and at the phosphate mines in Maury County.

Except by a few of the best farmers no crop rotation is followed. The rotation used by them consists of corn, wheat, and cowpeas sown immediately after the wheat is harvested. Sometimes cowpeas are planted in the corn. Systematic crop rotation should be more generally practiced, and either cowpeas or clover should be one of the crops included. Cowpeas will be found especially valuable, as they do well on all the soils. The rougher lands are cultivated solely to corn, and in a few seasons when the yields decrease greatly the fields are abandoned and new land is cleared for cultivation. Improved farm implements have been introduced within recent years and are now quite generally used.

With the removal of the forest and the settlement of the level uplands, locally known as the "barrens," the development of a better agriculture seems to be assured. Until recently these lands were considered of little value except for the timber growth, and while it is true the soil is not adapted to the staple crops, it has been ascertained that certain special crops will do exceptionally well, and the indications are that the "barrens" in a few years may become the most desirable and profitable land in the county, especially where located near the railroad stations.

It is claimed that this upland soil is peculiarly adapted to the growing of strawberries and cantaloupes, and to these crops an increased acreage will be devoted the coming season. The strawberry vines bear heavily and the berry is of superior quality, the varieties best suited to the soil being the Gandy and the Klondike, which ripen after the strawberry crop produced farther south has been disposed of and before the northern crop is ready to be marketed, thus insuring good prices.

The Rockyford cantaloupes produced on this soil are said to be as good, if not superior, to any grown in the United States outside of the irrigated districts. The vines bear exceptionally well, the fruit is well netted, and the meat is thick and of superior flavor. The strawberries and cantaloupes will be shipped in refrigerator cars in carload lots to northern markets, reasonable transportation rates being assured by the railroad officials. Several hundred acres are to be planted to both crops, and the prospect at this time seems to be bright for the development of these industries. Associations of growers have been formed in the county.

At present the greater part of the population of Lawrence County is composed of people from the more northern States, and settlers from that region, both farmers and skilled mechanics, are still investing in the level uplands and near the railroads. They are introducing improved methods and doing much for the betterment of the county. The elevation and moderate climate, together with the abundance of good spring water, makes it a healthful and desirable part of the State, and these considerations have aided in no small degree in influencing settlement.

The rural free delivery of mail is being extended in the county, and local telephone lines are used by many of the farmers.

The Louisville and Nashville Railroad, which passes through the county, has been an important factor in stimulating agricultural interests, as well as adding to the value of the timber resources, affording an access to outside markets for both the agricultural and forest products of the county.

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