

SOIL SURVEY OF OVERTON COUNTY, TENNESSEE.

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DESCRIPTION OF THE AREA.

Overton County, Tenn., lies in the north-central part of the State, or in the northeastern part of the division commonly known as Middle Tennessee. It is bounded on the north by Clay and Pickett counties, on the east by Fentress County, on the south by Putnam County, and on the west by Jackson County. It is the second county south of the Kentucky State line. There are in all 277,312 acres, or about 433 square miles, in the county.

The Cumberland Plateau and the mountains forming its western front occupy the southeastern third of the county, and a chain of

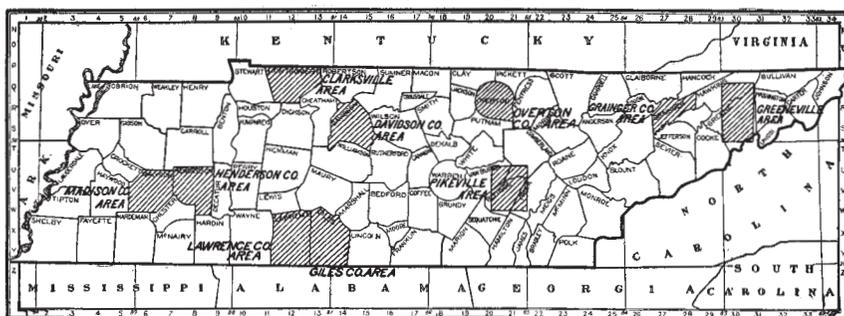


FIG. 26.—Sketch map showing location of the Overton County area, Tennessee.

outlying ridges extends out from the Cumberland Mountains in a northwestern course across the center of the county to within a few miles of the northwest boundary. This region is characterized by bold, rugged mountain topography, having a range in altitude from 700 to 2,000 feet. Lying immediately west of this, and reaching out from the foot of the mountains to the county boundary, is a broad, gently rolling plain, belonging to the Highland Rim of Tennessee and having an altitude varying from 900 to 1,000 feet. On the Highland Rim in the southwestern fourth of the county the surface is characterized by broad, level areas and low, rolling hills. Near the west line of the county, however, this plain has been dissected by the deep, narrow, V-shaped valleys of Spring Creek and Roaring River. The bottoms of these valleys approach the level of the Central Basin,

which lies farther west, and their escarpments are rough and steep. To the north of this and west of the outlying mountain range previously mentioned, Mill Creek, Mitchell Creek, and their tributaries have destroyed the characteristic features of the Highland Rim, leaving a series of rough, broken ridges. North of the mountains, and along the northeastern boundary of the county, the plain of the Highland Rim again appears. This is cut by the valleys of Eagle Creek and the West Fork of Obey River and their tributaries.

The drainage of the area is all toward the Cumberland River, which lies a few miles beyond the western boundary of the county. The larger streams flow through deep, narrow valleys, and have swift currents.

A permanent settlement in the area was established at Hilham in 1800. Two other settlements were made, near the present site of Livingston, before this, but their exact date is not known. As early as 1770 the region had been occupied by hunters for some time, but they made no permanent settlement. The county was organized in 1806, and at that time included the territory now comprised in the counties of Fentress and Pickett and parts of Clay, Putnam, Cumberland, Morgan, and Scott. The county seat was established at Monroe in 1810, where it remained until about 1835, when it was moved to Livingston, the present county seat. Most of the early settlers came from East Tennessee, Virginia, North Carolina, and Kentucky, and a few from the New England States.

Overton County was progressive and prosperous, and compared favorably with other sections of the State up to the era of railroad construction about 1860. The railroads naturally avoided the rough, mountainous country, and this gave the more level sections of the State a great advantage in attracting population and developing their agricultural resources. A slow retrogression took place in Overton County and continued for some time. In 1901 the Tennessee Central Railroad built a branch road into the southeastern part of the county to take out coal and timber. In 1906 the Overton County Railroad was built from Algood, in Putnam County, to Livingston, giving the central part of the county an outlet for its products, and as a result the county is once more improving and doubtless will make rapid progress in the future.

Livingston, the county seat, has a population of about 800 and is the social and commercial center of the county. It has two banks and several manufacturing industries, including a flour mill, sawmill, planing mill, spoke factory, stave factory, and spindle factory. Crawford, in the eastern part of the county, on the Tennessee Central Railroad, is a mining town of about 500 people. Several small stations and sidings, which serve as shipping points, are found along both railroads. Monroe, Hilham, and Oakley were at one time towns

of considerable importance, but now, owing to their lack of shipping facilities, serve only as interior trading points.

The roads of the county as a whole are in a very poor condition, many of the mountain roads having such steep grades and being so rocky as to be almost impassable. The dirt roads of the valleys and the Highland Rim are fairly good during the summer, but in winter are very muddy and become deeply rutted, making travel nearly impossible. Beds of chert and limestone are easily accessible to improve the roads at a relatively low cost. A short piece of macadam road is being constructed at Livingston, and it is probable that this will serve as an example and that the roads will receive more attention in the future.

At the present time lumber and coal are about the only products shipped out of the county, and most of these go to Nashville, which is about 100 miles west of Overton County. Some live stock is also shipped and sold in the Nashville market. The people employed in the lumbering and mining industries within the county furnish a local market for all the agricultural products grown, and will continue to do so for some time.

CLIMATE.

This region has a mild, pleasant climate and seldom experiences extremes of either heat or cold. During the summer months the days are warm, but the nights are always cool. Some snow falls each winter, but never remains on the ground for more than a week.

The table following, giving data in regard to temperature and precipitation, is compiled from the records of the Weather Bureau station at Byrdstown, which is located upon the Highland Rim a short distance northward in the adjoining county. The figures apply to that part of Overton County occupied by the Highland Rim, but for the Cumberland Plateau section, which is about 900 feet higher in elevation, the temperature averages about 3° F. lower than shown by the tables.

The average date of the last killing frost in spring is April 11 and of the first in fall October 20. This gives a growing season of 192 days, or about six and one-half months. The latest recorded frost in spring is April 24 and the earliest in fall September 30. This insures a growing season of nearly five and one-half months free from frost, which is ample time to mature all crops grown in this region. The rainfall during the growing season is sufficient to produce good crops, even in the driest year. It is usually quite evenly distributed. October is the driest month and some difficulty is had in getting wheat properly started.

Normal monthly, seasonal, and annual temperature and precipitation.

Month.	Temperature.			Precipitation.			
	Mean.	Absolute.		Mean.	Total amount for the driest year.	Total amount for the wettest year.	Snow, average depth.
		Maxi- mum.	Mini- mum.				
	°F.	°F.	°F.	Inches.	Inches.	Inches.	Inches.
December	38	70	- 9	4.2	5.8	5.5	3.7
January	37	72	- 8	4.3	3.6	6.7	3.9
February	36	73	-19	5.0	6.0	6.6	7.2
Winter	37			13.5	15.4	18.8	14.8
March	49	85	- 1	6.1	2.2	10.4	3.1
April	56	88	24	4.9	3.5	6.1	0.6
May	67	91	34	3.7	3.1	6.4	0.0
Spring	57			14.8	8.8	22.9	3.7
June	73	95	36	4.9	2.3	3.4	0.0
July	76	99	48	4.8	3.7	6.3	0.0
August	75	94	50	4.5	3.2	2.5	0.0
Summer	75			14.2	9.2	12.2	0.0
September	70	96	32	3.2	2.7	3.4	0.0
October	58	89	23	2.2	1.0	1.9	Trace.
November	47	79	11	4.2	2.2	1.6	0.7
Fall	58			9.6	5.9	6.9	0.7
Year	57	99	-19	52.1	39.3	60.8	19.2

AGRICULTURE.

At the time of the first settlements in Overton County transportation was not only difficult, but markets were distant and necessities had to be hauled over rough mountain roads. In some cases supplies were brought in wagons from Baltimore. Almost as much difficulty was experienced in disposing of the few surplus commodities produced, most of which were loaded in flatboats on the Cumberland River and floated downstream to New Orleans.

These conditions compelled the early settlers to produce nearly everything used by their families. With this end in view they found it necessary to grow a wide variety of crops, including corn, wheat, cotton, hemp, flax, and tobacco. Many kinds of vegetables were also grown in the garden to supply the family table. The cotton, hemp, and flax were worked up into homespun and made into clothing, and little if any of these three crops was included in the flatboat cargoes sent down the river. Some sheep were kept to produce the wool needed for local use.

Cattle and hogs were brought in at an early date and for many years were the principal source from which money was obtained. They were allowed to range at liberty through the forest, receiving little or no attention. In the fall the hogs were collected into large

droves and driven south into Georgia and Alabama, where they were sold to the cotton planters. The cattle were also taken across the mountains and disposed of in Virginia and North Carolina. For a number of years prior to 1860 mules were raised and taken farther south and sold in the cotton country.

For some time following 1865 conditions remained at a standstill, and in some cases there was an actual retrogression. The practice of driving stock out of the county was discontinued. Manufactured goods could be obtained from outside with greater ease, and the cultivation of hemp and flax was abandoned. The increased price of cotton caused that crop to be grown for market for a few years, but the cultivation of this crop ceased after 1870. Tobacco continued to be a profitable crop for a few years longer. Declining prices from 1876 to 1880 caused it to be discontinued as a commercial crop and it has not been cultivated for the market since. A few patches of cotton, a fourth of an acre or less in extent, are still grown for home needs, and many farmers cultivate a little tobacco for their own use.

Since 1890 there has been a gradual upward trend. Farmers are giving more attention to the cultivation of their crops and the care of their land. Formerly the old bull-tongue plow served the three-fold duty of plow, harrow, and cultivator. At the present time the turning plow is in general use, and many have disk and other modern harrows. The double-shovel cultivator is in general use, and some are using the more modern five and seven tooth iron-frame cultivators. In the more level portion of the county the binder has largely replaced the old grain cradle.

Corn is the principal crop produced in the county, the acreage planted to it being fully twice that of all other crops. It is grown in all parts of the county and upon all of the types of soil with varying success. The difference in size and color of the growing crop as observed on the light soil of the Cumberland Plateau and the rich Hagerstown stony loam is very striking, the latter soil being capable of producing at least three times as much grain. According to the Twelfth Census 34,449 acres were planted to this crop in 1899, producing 469,780 bushels, or an average of 13.6 bushels per acre. Wheat is the second crop in importance, but with acreage far below that of corn. The census gives the total as 5,662 acres, with a yield of 29,410 bushels, or 5.2 bushels per acre. The cultivation of wheat is confined almost entirely to the Decatur loam and the Clarksville silt loam. Oats are third in importance, with a total acreage of 3,713 acres, and a yield of 28,780 bushels, or 7.7 bushels per acre.

The authority just cited gives 3,671 acres as the area in clover, millet, other tame grasses, and small grains cut for hay, and the yield of 3,202 tons, or a little less than 1 ton per acre; an acreage of 237

acres as planted in potatoes, producing 51.7 bushels per acre, or a total yield of 12,264 bushels; 326 acres in sweet potatoes, with a yield of 74.1 bushels per acre, or a total of 24,171 bushels, and 658 acres as devoted to miscellaneous vegetables, the crop having a value of \$25,118. The last three items considered were confined to gardens and small plats, the crop being intended for home use. The value of orchard products, nearly all apples, according to the same authority, was \$26,639.

There are 235,615 acres included in the farms of Overton County. Of this 99,414 acres, or 42 per cent, is improved. The total number of acres in crops was 49,488 acres, or slightly less than one-half the area reported as improved land. Of the improved land not under cultivation a small portion is used for pasture, but the most of it is allowed to lie idle and grow up to weeds and briars. After lying fallow for one or two years, it is again brought under cultivation and other fields allowed to rest. Most of the land reported as unimproved was covered with a fine growth of timber. The value of the forest products for 1900 was \$63,483. Since 1900 lumbering has become the most important industry in the county, and the output of forest products has greatly increased. There has also been considerable improvement along other lines, but the census data will serve as an index of general conditions.

Not much live stock is kept. Most farmers have one or two cows, and a few steers and beef cattle are sold each year, but the annual shipments from the county will not exceed five carloads. The number of hogs slaughtered is quite large, but the pork is all used in the county. A few mules are sold in outside markets.

The adaptation of soils to different crops is recognized to some extent. Wheat is confined to the limestone soils and most of the apple orchards are located on either the Clarksville stony loam or the Dekalb stony loam. The importance of crop rotation is not well understood, and many cultivate a field continuously in the same crop for two or three years, allowing it to grow up in weeds for several seasons after that. Fortunately Japan clover has become thoroughly established in the county, and where a field is left uncultivated the clover takes possession of it, and the result is much the same as though the field had been planted in some cultivated leguminous crop. A few follow wheat with cowpeas the same season, using the vines as hay. Others plant the cowpeas in corn at the last cultivation and harvest the seed. The value of this crop is not generally recognized and its cultivation is limited.

The farm methods practiced throughout the county are quite variable. Preparing the land for corn is done in the spring, the ground being usually broken from 3 to 5 inches deep and harrowed once or twice before planting. Very few put manure on the land

and the use of fertilizers is not general. Wheat is usually sown in October, either upon land prepared in August and September or following corn.

Most of the farm labor is performed by the farmer and his family. A few, however, hire hands for three to five months each year, paying from \$15 to \$20 a month with board. Others hire day labor for a short time during the busy season, paying on the average 75 cents a day. Efficient help may usually be secured.

The greater number of the farms are operated by the owners. Where land is rented the tenant usually furnishes everything and receives two-thirds of the crop.

The farms vary greatly in size, the average holding, according to the census of 1900, containing 106.4 acres. The average value at that time, including improvements, was \$5.42 an acre. Land values range now from \$3 to \$25 an acre. The Decatur loam and the Clarksville silt loam, depending upon position and improvements, are worth from \$5 to \$25 an acre. The stony loam areas can be purchased for \$3 to \$15, while some of the Dekalb soils in the eastern part of the county sell as high as \$50 an acre. This is due to the presence of coal and timber, and it would be hard to determine their agricultural value.

The greatest agricultural need of the county is better preparation and cultivation of the soils. The depth of plowing should be increased to 8 or 10 inches, and after plowing the ground should be thoroughly worked with a harrow to give a mellow seed bed. With corn and other intertillage crops the cultivation should be shallow and frequent and should be continued where practicable throughout the growth of the crop. A small-tooth cultivator should be used in order to keep the surface of the soil as nearly level as possible and to avoid cutting the roots of the growing plant. Where such crops are planted on hilly land the rows should be made to follow the contour of the hill. This would prevent to some extent the washing that now results from water flowing down hill in the furrows. As much organic matter as possible should be worked into the soil, and with this end in view all manure should be carefully saved and cow-peas or other green crops should be grown and plowed under at frequent intervals. Most of the soils in the county would be improved by applying lime at the rate of 2,000 pounds an acre every five years.

The rotation of crops should receive more attention. Each farmer should grow the crops best suited to his needs, but every rotation should contain a cultivated crop, a hay crop, and pasture. In this region legumes, grass, and pasture should occupy the land three years out of five. The following rotation is one of several which will be found adapted to this section: First year, corn followed by

winter oats; second year, harvest oats and sow cowpeas, in fall sow wheat and seed with red clover, orchard grass, and redtop; third year, harvest the wheat crop; fourth and fifth years, use for hay and pasture.

Cowpeas form a crop which is grown only to a limited extent at present, but its use should become general because of the great value of the crop as a stock feed and the beneficial effect it has on the land. The soy bean is another leguminous crop little known here, but one having an equal value with cowpeas and making a larger yield per acre. Cantaloupes, strawberries, and other truck crops can be grown successfully on the Decatur loam and the Clarksville silt loam, and with better market facilities will prove valuable additions to the present products grown in the county. There are many apple orchards at present on the different stony loam soils of the county. The trees yield well, but most of them are seedlings or inferior varieties. These should be top-grafted and in five years they will be producing profitable crops. There are many advantageous locations for setting out apple orchards in the county. Grapes can also be produced successfully, but the stony soils, where not in orchards or vineyards, should be kept in pasture or allowed to reforest. Stock raising on such land will prove more profitable than any system of cropping. The more rugged and broken hills and mountain sides should be left in permanent forest. The return that can be obtained from time to time by cutting the new growth of timber will be greater than would be realized from the land under cultivation.

SOILS.

Overton County lies within the Appalachian province, and embraces portions of two of its physiographic divisions—the Cumberland Plateau and the Highland Rim. The rocks are sedimentary in origin and consist of sandstones, shales, and limestones, and the geological formations represented extend from the lower Silurian to near the close of Carboniferous time.^a These rocks lie in nearly level beds, having a slight dip to the southeast. The mountainous topography found over a large part of the county is the result of erosion. The streams during a long period of time have cut deep, narrow, steep-sided valleys, leaving only the tops of narrow ridges to show where a broad, nearly level plain once existed.

The soils found here, with the exception of the bottom lands, which have a very limited development, consist of residual material, resulting from the decomposition and disintegration of the underlying rocks. Most of the geological formations present quite distinct characteristics, and the soils derived from them show an equal dis-

^a For a detailed discussion of the geology of this region see Geologic Atlas No. 53, U. S. Geological Survey.

tinctness, so that the boundaries of the different types of soil agree closely with the boundaries of the formations from which they are formed. On the steep mountain slopes, however, there has been a downward or creeping movement of the soil mass, causing the material derived from several different formations to blend together and assume a nearly uniform character over the entire slope. The Highland Rim and the valleys which intersect it are occupied mainly by limestone formations, some of which contain a great deal of chert and siliceous impurities. These have given rise to gray and red silty soils. The gray soils have been included in the Clarksville series, and the red soils in the Decatur series.

The formations exposed on the Cumberland Plateau and its escarpment consist of sandstone and shale. These give rise to soils having a nearly uniform gray color and characterized by a greater percentage of sand than is found in the soils of the Highland Rim. Three types were mapped here, all belonging to the Dekalb series. At the bottom of the deep, narrow valleys in the northwestern part of the county a brown, silty, stony loam has been formed. This type is a result of the weathering of Silurian limestone, and belongs in the Hagerstown series.

Some of the streams have built up narrow bottoms of alluvial material along their courses. These bottoms are limited in extent, while the texture of the soil is quite variable. They have therefore been mapped under the general name Meadow.

The following table gives the name and area of each of the soil types found in the county. Their distribution is shown by means of colors in the accompanying map.

Areas of different soils.

Soil.	Acres.	Per cent.	Soil.	Acres.	Per cent.
Clarksville silt loam.....	78,272	28.2	Decatur loam.....	11,584	4.2
Dekalb stony loam.....	67,840	24.5	Meadow.....	4,672	1.7
Clarksville stony loam.....	51,008	18.3	Hagerstown stony loam.....	1,344	.5
Dekalb silt loam.....	17,984	6.5	Guthrie silt loam.....	256	.1
Decatur stony loam.....	17,600	6.3	Total.....	277,312
Dekalb sandy loam.....	13,824	5.0			
Rough stony land.....	12,928	4.7			

HAGERSTOWN STONY LOAM.

The Hagerstown stony loam consists of 8 to 12 inches of heavy brown silty loam, resting upon a subsoil of light-brown to brownish-yellow or yellow clay loam, which grades into a heavy clay at a depth of 18 to 24 inches. Both soil and subsoil contain rock fragments in varying quantities, and the surface is strewn with loose rock and boulders, while there are frequent outcrops of the underlying massive

brown and blue limestone. In many cases these outcrops are extensive enough to be separated and mapped as Rough stony land.

This type of soil is found in the northwestern part of the county, at the bottom of the deep, narrow valleys of Mitchell and Mill creeks and their tributaries. It occupies the lower slopes of these valleys, the surface sometimes being so steep that plowing is impracticable. This condition causes it to wash easily, and the soil is badly damaged by erosion where it is not carefully protected.

The Hagerstown stony loam is a residual soil derived from the decomposition of the Normandy limestone of Silurian age. Its stony character is the result of position, which is so steep that much of the fine earth is removed as fast as it is weathered, leaving behind an accumulation of unweathered rock fragments.

Originally this soil was covered with a forest growth of oak, hickory, and other hardwoods, but most of it has been cleared and is under cultivation at the present time, for it is a strong, productive soil and valuable despite the difficulty of working it. Corn, the principal crop, gives yields ranging from 25 to 50 bushels per acre.

CLARKSVILLE STONY LOAM.

The Clarksville stony loam consists of a gray to light-yellow or light-brown silty loam, 8 to 10 inches deep, underlain by a yellow to reddish-yellow silt loam. From 20 to 40 per cent of angular chert fragments, varying from a fraction of an inch to 8 or 10 inches in diameter, are incorporated in the soil and strewn upon the surface. The quantity of such cherty material increases in the subsoil with depth, and the material finally passes into a mass of broken rock. Sometimes this condition is encountered at a depth of 2 feet, but usually the change is more gradual and some fine interstitial material persists to depths of 4 to 10 feet.

The greater part of the Clarksville stony loam is found in the northern part of the county. Narrow strips occur along the valleys of the West Fork of Obey River, Roaring River, and Spring Creek, in the central and southern parts of the county. Other areas are found at the base of the mountains east and northeast of Netherland, and near the bottom of Sinking Cane and other large limestone sinks in the southern part of the county. This type of soil occupies rough, broken hills and steep valley slopes.

The stony character of the Clarksville stony loam makes it more porous than most soils of similar texture, and at the same time the rock fragments scattered over the surface retard the movement of the water to some extent, so that it does not suffer as much from erosion as many soils occupying a like position.

This is a residual soil derived for the most part, through decomposition and disintegration, from the Waverly formation of Car-

boniferous age. This formation consists largely of a cherty, impure limestone. Some of the higher lying areas are probably derived from cherty material at the base of the Newman limestone.

A large part of this type of soil is still covered with forests of oak, poplar, hickory, beech, maple, elm, chestnut, and ash. That portion under cultivation is planted largely to corn, which produces from 15 to 30 bushels per acre. Wheat and oats are grown to a less extent. A few apple orchards have been planted on the type and the trees have made a fine growth. Clover, redtop, and other grasses can be grown with success, and it is probable that the greatest opportunity open to owners of this soil lies along the lines of stock raising and apple culture. The more broken areas can not be cultivated successfully and should be kept in permanent forest.

CLARKSVILLE SILT LOAM.

The soil of the Clarksville silt loam consists of a gray to light-yellow silt loam, varying in depth from 8 to 12 inches. When dry the surface material has a soft flourlike feel; when wet it is easily puddled and becomes almost as impervious as clay. The subsoil, where typically developed, is a compact yellow silt loam. It usually extends to a depth of 3 feet or more, and is somewhat heavier than the surface soil. In some instances the color changes at 18 to 30 inches to a reddish brown and then grades slowly into a red silty clay. The type for the most part is free from stone, but occasional small areas occur where some chert is found in both soil and subsoil.

The Clarksville silt loam is one of the most extensive types of soil found in Overton County. It occurs in a large continuous area in the western and southwestern parts of the county and again in the northeastern part on the table-land on both sides of Eagle Creek, the two areas being separated by the mountains which form the divide between Eagle and Nettlecarrier creeks on the east and Spring Creek and Roaring River on the west. Small areas occur on the tops of ridges in the northwest part of the county and in the valley of the West Fork of Obey River in the eastern and southeastern part of the county.

Areas of this soil usually occupy level to rolling country occurring at elevations of 900 to 1,000 feet above sea level. In the western part of the county, however, the surface often becomes hilly and broken without developing any stony areas. In this respect the soil here differs from the type as found in other areas previously mapped in the State, where any marked relief of surface gives rise to the Clarksville stony loam. The natural drainage is usually sufficient to carry off the surplus water over the greater portion of the type. A few of the larger areas, however, are so flat that water flows away very slowly, and it is usually late in the spring before the soil is dry

enough to work well. Such areas may be improved by artificial drainage, either by means of open ditches or tile drains.

The Clarksville silt loam is a residual soil derived from the weathering of the Waverly formation. The more soluble part of the rock has gradually passed into solution and been carried away in the drainage waters, leaving behind the siliceous residue to form the present soil.

Originally a forest growth consisting of white oak, post oak, red oak, hickory, black gum, sweet gum, chestnut, persimmon, dogwood, and poplar covered the Clarksville silt loam areas and there are still large areas in forest. A considerable extent has been cleared, however, and probably one-half the improved land of the county is of this type of soil. Mixed farming is the usual practice. Corn is the principal crop and yields from 15 to 25 bushels per acre. Wheat is second in importance, the yields ranging from 8 to 12 bushels per acre. There is a moderate acreage in oats, of which the yields range from 15 to 25 bushels per acre. Sorghum, cowpeas, and some of the grasses are grown to a limited extent.

Though only moderately productive, this soil, owing to its favorable position and the ease with which it may be cultivated, is one of the most desirable soils for farming in the county. It produces excellent vegetables and small fruits and in some sections of the State cantaloupes and strawberries of exceptionally fine quality. The soil is usually slightly acid in reaction, and is deficient in organic matter. Lime should be applied to neutralize the acidity, and special care should be taken to return all manure to the land and to plow under cowpeas and other green manuring crops. The soil is very easily compacted, and deep plowing is necessary to maintain it in the friable, open condition best for growing plants. Subsoiling once in three or four years would be found beneficial. Where fertilizers are used acid phosphate is found more profitable than a complete fertilizer.

The following table gives the results of mechanical analyses of the soil and subsoil of the Clarksville silt loam:

Mechanical analyses of Clarksville silt loam.

Number.	Description.	Fine gravel.	Coarse sand.	Medium sand.	Fine sand.	Very fine sand.	Silt.	Clay.
		<i>Per cent.</i>						
19129.....	Soil	0.6	1.3	1.5	17.9	10.4	54.0	13.6
19130.....	Subsoil.....	.4	1.1	1.3	14.6	9.1	41.2	31.7

DECATUR LOAM.

The Decatur loam where typically developed consists of a dark-brown to reddish-brown or red silty loam 8 to 12 inches deep, resting

on a subsoil of reddish-brown to red silty loam which grades into a dark-red silty clay at a depth of 24 inches. Several areas, however, were encountered where the first 6 to 8 inches of soil is gray to brown, though below that depth the typical Decatur subsoil is found. Such areas were mapped with this type rather than with the Clarksville silt loam. The two soils are usually associated with each other, and the transition from one to the other generally extends over a wide strip, resulting in the variation just described. The soil is usually free from stone, but in a few instances chert is found in both soil and subsoil.

The Decatur loam in Overton County is found in a number of small areas scattered over a strip of country extending across the county from northeast to southwest. It reaches its greatest development around Livingston and Oak Hill in the southern part of the county.

Limestone sinks are common in the areas of the Decatur loam, the surface of which in general varies from hilly—the hills being low and rounded—to nearly level. Naturally the type is well-drained; at the same time the texture is such that sufficient moisture is retained to produce good crops in average seasons. Most of the sink holes have openings in the bottom through which the surface water drains away. In some cases, however, these openings have been closed and ponds are formed.

The Decatur loam is derived largely from the basal rocks of the Newman limestone and to some extent also from the upper strata of the Waverly formation, which underlies the limestone and which is more largely the source of the material forming the Clarksville silt loam. The rocks of these two formations consist chiefly of shales and cherty limestones. The two types of soil are usually intimately associated and are in places apparently derived from the same formation.

The timber growth on this soil is much the same as found on the Clarksville silt loam. The method of farming and crops grown are the same as with the latter type, but the Decatur loam is a stronger, more productive soil. It is better for grass and is used more for hay and pasture than is the Clarksville silt loam. What has been said about special crops for the Clarksville silt loam and the methods of handling that type apply in a general way to this soil as well. The finest Rockyford cantaloupes produced in the State have been grown on farms marking the line of transition from one of these soil types to the other.

The following table gives the results of mechanical analyses of the soil and subsoil of the Decatur loam:

Mechanical analyses of Decatur loam.

Number.	Description.	Fine gravel.	Coarse sand.	Medium sand.	Fine sand.	Very fine sand.	Silt.	Clay.
		<i>Per cent.</i>						
19137.....	Soil	0.4	1.7	3.2	22.9	12.1	42.0	17.6
19138.....	Subsoil.....	.2	1.1	1.5	16.4	19.3	40.5	29.2

DECATUR STONY LOAM.

The Decatur stony loam consists of a heavy reddish-brown to red silty loam, underlain by a red clay which becomes decidedly heavier in the lower depths. Fragments and irregular blocks of massive blue limestone occur in the soil and subsoil and scattered over the surface. Bed rock is frequently exposed and in many cases the rock outcrop is so general and the quantity of loose rock so great that it was necessary to map such areas as rough stony land.

Areas of the Decatur stony loam are found in the northern, central, and south-central parts of the county. It occupies the sides and tops of rough, rugged hills and occurs as bands extending along the steep slopes at the foot of the mountains. It results from the weathering of the lower member of the Newman limestone. On the steep slopes much of the fine earth has been removed by wash, exposing the underlying bed rock or causing an accumulation of limestone fragments and boulders on the surface, and this gives rise to the extremely stony character of the type.

The Decatur stony loam was originally covered with a heavy growth of timber, consisting of oak, hickory, black walnut, chestnut, and poplar. It is a strong, productive soil, but on account of its rough, stony character much of it has been allowed to remain in forest. Corn is the principal crop and produces from 20 to 35 bushels per acre. Grass does well and the land makes good pasture.

GUTHRIE SILT LOAM.

The Guthrie silt loam consists of an ash-gray to grayish-white silt loam, 7 to 10 inches deep, resting on a subsoil of about the same color as the soil, but containing more clay. Usually at a depth of 20 to 30 inches the material becomes mottled and stained with yellow iron rust, and small lime concretions appear. When wet the soil is quite sticky and plastic, but upon becoming dry it readily crumbles into a fine flourlike material.

In Overton County this type has a limited development, being confined to a few small areas near Livingston in the central part and

in the southern part of the county. It is found in low, level areas and basinlike depressions having little or no drainage. It is for the most part a residual soil derived from the underlying limestone, but it is probable that a small part of the material has been washed from surrounding areas of Clarksville silt loam and Decatur loam. Owing to lack of drainage there has been less oxidation than in the higher lying soils; hence the light color of the soil.

Most of the large timber has been cut and the areas are now covered with a growth of bushes and wild grasses which afford some pasture. The soil is largely in a swampy or semiswampy condition and no attempt is made to cultivate it. By underdrainage, however, and by using heavy applications of lime it could be made fairly productive, though it is doubtful if the expense would be warranted while the present land values exist.

DEKALB SILT LOAM.

The Dekalb silt loam consists of 8 to 12 inches of gray to grayish-yellow silt loam, containing a small amount of the finer grades of sand, resting upon a light-yellow subsoil of like texture but of more compact and impervious structure. In some cases the color of the subsoil changes to a brownish or yellowish hue, resembling the color of the underlying rock from which the type is derived.

This is an important Cumberland Plateau soil. It occupies large irregular areas scattered over a strip of country, several miles in width, which extends across the center of the county north and south. Most of the areas occur at a nearly uniform elevation above sea level, about 1,300 feet, though in the eastern part of the county there are two areas lying 400 to 500 feet higher. The soil owes its origin largely to the disintegration of a fine-grained brownish or yellowish sandstone which occurs as a lentil in the Newman limestone. It seems probable that the soil has been somewhat influenced by the decomposition of a thin bed of shale associated with the sandstone. The weathering of the sandstone has been rather slow and uniform, with the result that the soil occurs as broad nearly level areas on the tops of isolated hills and the long spurs reaching out from the western slope of the Cumberland Mountains. It is also found in well-defined terraces, from one-eighth to one-fourth mile in width, about halfway up the face of the Cumberland escarpment.

While this type of soil occupies an elevated position, the surface is so nearly level that drainage water flows away very slowly and in many cases artificial drainage would be beneficial. In some of the larger areas, spots several acres in extent are found where a semi-swampy condition prevails. In a few places sink holes are found. These have been formed through the falling of the roofs of caverns

in the underlying massive limestone, the superimposed sandstone strata being too thin to bear the strain.

The native growth found on the Dekalb silt loam consists of oak, chestnut, chinquapin, ash, hickory, poplar, and dogwood. The soil is not as productive as some of the other types, but owing to its level surface and the ease with which it can be cultivated many have improved it, and nearly half of it is at present under cultivation. Corn, wheat, oats, sorghum, and other crops are grown. Corn produces 15 to 20 bushels per acre, and wheat 6 to 10 bushels per acre. The soil is noticeably low in organic matter, and special care should be taken to supply this deficiency by plowing under green crops and manure. The mineral fertilizers, potash and phosphorus, would be found beneficial. A fine quality of Irish potatoes can be produced on this soil and peaches do well. These two products and small fruits should be the most profitable crops on the type.

The following table gives the results of mechanical analyses of the soil and subsoil:

Mechanical analyses of Dekalb silt loam.

Number.	Description.	Fine gravel.	Coarse sand.	Medium sand.	Fine sand.	Very fine sand.	Silt.	Clay.
		<i>Per cent.</i>						
19147.....	Soil	0.2	1.1	0.4	16.1	9.6	57.9	13.9
19148.....	Subsoil.....	.2	.5	.3	10.3	11.7	55.2	21.1

DEKALB STONY LOAM.

The surface soil of the Dekalb stony loam is a gray to light-yellow medium to fine sandy loam containing a considerable quantity of sandstone and other rock fragment. The subsoil is somewhat variable, the greatest portion of it, however, consisting of a yellow fine sandy loam or loam. In some cases it ranges from a heavy yellow loam to clay loam or clay. These differences are due to the variations in the rock from which the type is derived.

In the southeastern quarter of the county this is the prevailing type of soil. It also occurs as a narrow band occupying the upper slopes of the mountains which extend out into the central and north-western part of the county. This band occurs just below the Dekalb silt loam which caps these outliers. The Dekalb stony loam occupies the steep rugged mountain slopes having an altitude ranging from 1,000 to 2,000 feet. The water falling upon these steep surfaces flows swiftly away, carrying a large quantity of the finer soil particles with it. If it were not for the protection afforded by the heavy forest which covers most of these mountains, much of the surface

soil would be quickly washed away, leaving the region in a badly eroded condition.

The Dekalb stony loam has been produced by the weathering of Carboniferous rocks, including all of the formations found in this county above the lower member of the Newman limestone. These are for the most part sandstone and sandy shales, but a few bands of clayey shale are found. Seams of coal are interbedded with the other material, but have no influence on the soil. The higher lying formations are sandstone and the material derived from their disintegration has crept down over the steep slopes, mixing with other material and giving the soil a uniform character over the entire slope. The subsoil comes direct from the underlying formation and is therefore more variable, the sandstone giving rise to a sandy loam to loam, while the material from the shale and limestone varies from a heavy loam to clay. The weathering has been by no means complete, and a large quantity of rock fragment is found in both soil and subsoil and scattered over the surface. The sandstone frequently stands in cliffs, below which large blocks of rock cover the ground. The limestone also has resisted weathering to a considerable extent, and in many places the surface is covered with outcrops and large boulders of this material. The larger areas of this character have been mapped as rough stony land, but many too small to be shown on the map were included in the Dekalb stony loam.

These mountain slopes were at one time all covered with a heavy growth of timber consisting of oak, hickory, chestnut, and poplar. A few small areas have been improved and much of the type is being rapidly deforested by lumber companies. Corn and a few vegetables are about the only crops that have been grown on the cleared areas. The yields of corn are light, from 10 to 20 bushels per acre. A few apple orchards have been set out and the trees make a fine growth and bear quite regularly, showing that in favored locations apples can be grown successfully. Where the heavier subsoil exists grass does well and the land may be used for pasture. By far the greater portion of the soil, however, is too rough for agricultural use and should be left permanently in forest. The marketable timber obtained from time to time will be far more valuable than any returns that could be obtained by cultivating the land.

DEKALB SANDY LOAM.

The soil of the Dekalb sandy loam is grayish to yellowish in color, varies in texture from a fine sandy loam to heavy sandy loam, and has a depth ranging from 8 to 12 inches. The subsoil is a medium to fine heavy yellow sandy loam which frequently grades into a loam. The sandstone from which it is derived is usually encountered at a

depth of 4 to 12 feet, and when the surface is sloping it is sometimes exposed as an outcrop. The soil for the most part is free from stone, but blocks of sandstone are occasionally scattered over the surface.

The Dekalb sandy loam is found in the eastern and southeastern parts of the county and occupies the tops of high mountain ridges—outliers of the Cumberland Plateau. The surface features vary from level to gently rolling, but its position at the top of the mountain and the relatively light texture of the soil insure ample drainage. At the same time little damage is done by erosion. The soil is not retentive of moisture and crops are inclined to suffer from drought. It is a residual soil derived from the disintegration and breaking down of the Rockcastle conglomerate, a formation consisting largely of massive, cross-bedded gray sandstone with some small white quartz gravel scattered through it. The rock forms cliffs from 10 to 60 feet high at the outer edge of the Dekalb sandy loam.

The same native vegetation is found here as on the Dekalb stony loam, but the growth has not been as vigorous, and the timber is not as large. Most of the soil is still in forest. Where it has been cultivated corn is the principal crop, and yields not exceeding 20 bushels per acre are obtained. The soil is easily worked, and, with the aid of manure and commercial fertilizers, good yields of Irish potatoes, tomatoes, string beans and other truck crops, and small fruits may be obtained. These products would find a ready sale at local markets, which have been created in this region by the development of the large lumbering and mining industries.

The following table gives the results of mechanical analyses of the soil and subsoil of the Dekalb sandy loam:

Mechanical analyses of Dekalb sandy loam.

Number.	Description.	Fine gravel.	Coarse sand.	Medium sand.	Fine sand.	Very fine sand.	Silt.	Clay.
		<i>Per cent.</i>						
19155.....	Soil	0.4	4.8	17.4	16.5	4.0	37.8	19.0
19156.....	Subsoil.....	.4	5.6	18.8	16.5	4.2	33.4	20.9

ROUGH STONY LAND.

In Overton County the name "Rough stony land" has been applied to areas where there is sufficient rocky material at the surface, either in the form of rock outcrop or as boulders and rock fragments, to prevent the use of the land for any agricultural purpose other than pasture. Such areas are developed in varying degrees in connection with all the stony loam types. The larger areas are all shown in the map, but there are many smaller ones scattered through the stony loam soils that are too small to be indicated.

The most extensive Rough stony land areas occur on the steep slopes of the deep, narrow creek valleys in the northeastern, northern, and western parts of the county. Other areas occur along the sides and at the tops of the lower mountains in the central and southern parts of the county. A few areas are found in the eastern part of the county near the top of the main ridge forming the divide between the east and west forks of Obey River.

Rough stony land is derived principally from the sandstones and cherty limestones. Sometimes where it is derived from limestones there are small patches of dark-colored loam or clay loam which are suitable for cultivation, but such areas are too small to be indicated in the map. Most of the Rough stony land is covered with a heavy growth of timber, but in places where the underlying rocks lie very close to the surface and where the soil is very thin the growth is small and scraggy.

MEADOW.

The name "Meadow" has been applied to the bottom lands found along the creeks and rivers throughout Overton County. These Meadow areas occur as long, narrow, practically level strips sometimes on one side of the stream and sometimes on both sides. They are seldom over one-eighth mile in width and usually much narrower.

In texture the soil is variable. In the western and northwestern parts of the county the material is a rather heavy brown silt loam, while in the central part of the county, where the bottoms are found within the Clarksville silt loam, the soil though silty is lighter in color. In the eastern and northern parts of the county the soil is usually sandy and frequently quite gravelly. Some of the Meadow areas are poorly drained and somewhat swampy.

The Meadow is practically all cleared and under cultivation at the present time, and is usually more productive than the adjoining hill types.

SUMMARY.

Overton County, lying in the north-central part of Tennessee, has an area of about 433 square miles. It includes portions of the Cumberland Plateau and Highland Rim of Tennessee. The surface features vary from broad nearly level areas to mountains; about two-thirds is rough and broken. It is drained by a number of small streams which flow into Cumberland River.

The county was settled about 1800, and organized in 1806. It was for a long time without railroads, but at present there are two short lines giving service to the southern and central sections. Livingston is the county seat with a population of about 800. Other small towns are Crawford, Monroe, Oakley, and Hilham.

The county has a mild, pleasant climate with little extreme heat or cold. The mean temperature is 57° F. and the average annual rainfall 52.1 inches.

Lumber and coal are the leading products shipped out of the county, and Nashville is the principal market. Corn is the important agricultural product, the acreage being twice that of all other crops. Wheat is second in importance. Other crops are oats, clover, millet, and other grasses for hay. Potatoes, garden vegetables, and fruit are grown to a limited extent. But little live stock is kept.

The farmers do most of their own work. Farm labor may be had at 75 cents a day or from \$15 to \$20 a month. Most of the farms are operated by their owners. Agricultural land ranges in value from \$3 to \$25 an acre.

With the exception of a limited amount of bottom land the soil of the county consists of residual material formed by the weathering of the underlying rock. The boundaries of most of the types agree closely with the outline of the formation from which they are derived, and eleven types of soil were recognized and mapped.

The greatest need of the county is better preparation and cultivation of the land. Most of the soils would be improved by the use of lime, and rotation should be practiced. Cantaloupes and other truck crops can be grown to advantage on the Decatur and Clarksville soils. Apples and grapes would be profitable on the stony loams.

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