

U. S. DEPARTMENT OF AGRICULTURE,

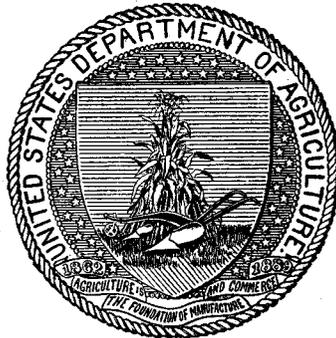
BUREAU OF SOILS—MILTON WHITNEY, Chief.

SOIL SURVEY OF LAUDERDALE COUNTY,
ALABAMA.

BY

F. E. BONSTEEL, ORLA L. AYRS, THOMAS D. RICE,
AND E. P. CARR.

[Advance Sheets—Field Operations of the Bureau of Soils, 1905.]



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.]

CONTENTS.

	Page.
SOIL SURVEY OF LAUDERDALE COUNTY, ALABAMA. By F. E. BONSTEEL, ORLA L. AYRS, THOMAS D. RICE, and E. P. CARR.....	5
Location and boundaries of the area.....	5
History of settlement and agricultural development.....	6
Climate.....	7
Physiography and geology.....	7
Soils.....	9
Clarksville fine sandy loam.....	9
Clarksville clay loam.....	10
Clarksville silt loam.....	12
Clarksville stony loam.....	13
Clarksville loam.....	14
Guthrie clay.....	16
Agricultural methods.....	17
Agricultural conditions.....	18

ILLUSTRATIONS.

TEXT FIGURE.

	Page.
FIG. 1. Sketch map showing location of the Lauderdale County area, Alabama.....	5

MAP.

Soil map, Lauderdale County sheet, Alabama.

SOIL SURVEY OF LAUDERDALE COUNTY, ALA.

By F. E. BONSTEEL, ORLA L. AYRS, THOMAS D. RICE, and E. P. CARR.

LOCATION AND BOUNDARIES OF THE AREA.

Lauderdale County, Ala., is embraced within the parallels $34^{\circ} 43'$ and 35° north latitude and the meridians $87^{\circ} 12'$ and $88^{\circ} 12'$ west longitude, and occupies the extreme northwestern part of the State. It is bounded on the north by Hardin, Wayne, and Lawrence Coun-

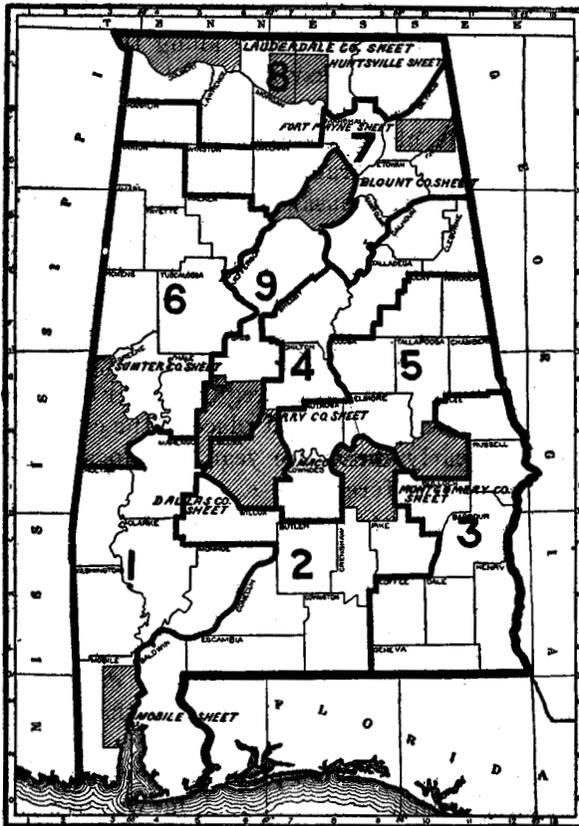


FIG. 1.—Sketch map showing location of the Lauderdale County area, Alabama.

ties, of Tennessee; on the east by Limestone County, Ala., and the Elk River; on the south by Lawrence and Colbert Counties, of Alabama, and on the west by Tishomingo County, Miss., the south bank of the Tennessee River forming the boundary line on the south and west. Its greatest length is 57 miles in an east-and-west direction,

and its greatest width from north to south 20 miles. The total area is 453,056 acres, or about 708 square miles. Florence, the county seat, is a thriving town of some 8,000 or 10,000 inhabitants, located on the river about midway of the county. Rogersville, in the eastern, and Waterloo, in the western, part are the only other towns of importance in the area.

HISTORY OF SETTLEMENT AND AGRICULTURAL DEVELOPMENT.

Lauderdale County was one of the first sections of Alabama settled by white people, the early settlers coming from Virginia, the Carolinas, and eastern Tennessee. It was established as a county during the Territorial period of the State, and its organization was completed upon the admission of Alabama into the Union as a State in 1818. The first settlements were made along the Tennessee River, mostly upon the areas of Clarksville clay loam, which were soon cleared and have been under constant cultivation since. Scattered settlements were made along Cypress, Shoal, Bluewater, and the other large creeks. These gradually spread over other portions of the county, but there are thousands of acres still unoccupied.

The early settlers began the cultivation of cotton, corn, wheat, oats, and a few other minor crops. Cotton was the leading crop on the Clarksville clay loam. On the other types of soil corn was the most important. Up to the present time there has been but little change in the kind of crops or their relative importance.

Cattle and hogs have been raised regularly for local supply, but they have never occupied a prominent place in the county's resources. Both run at large nearly the entire year, the hogs feeding largely upon the mast in the oak forests.

About 1870 a colony of Germans settled at St. Florian. These people confined themselves to comparatively small farms (40 to 80 acres) and gave them careful cultivation. They have grown but little cotton, giving their attention instead to the products they were more familiar with, such as the grains, truck crops, and small fruits. They have been very successful, showing that much better results can be obtained from the small general farm than from the large cotton plantation.

Prior to the Civil War the cotton plantations were worked by slave labor. At the close of that conflict everything was in a chaotic state, and the landowners found themselves without sufficient labor to operate their plantations. As a result hundreds of acres were thrown out of cultivation and soon occupied by a scrub growth characteristic of the "old fields" of the South, while their owners sought employment in the cities and in other parts of the United States. These "old fields" have been gradually brought back under cultivation, but wide areas are still unoccupied.

CLIMATE.

The climate of Lauderdale County is mild and equable. No extreme heat is experienced during the summer, the nights being cool during the entire season. Occasionally the temperature falls to zero or below in winter, but these occurrences are rare.

The following tables compiled from records of the Weather Bureau stations at Florence, in the south-central part of the county, and at Riverton, lying just across the Tennessee River, give the normal temperature and rainfall and the dates of the last killing frost in spring and the first in fall:

Normal monthly and annual temperature and precipitation.

Month.	Florence.		Riverton.		Month.	Florence.		Riverton.	
	Temperature.	Precipitation.	Temperature.	Precipitation.		Temperature.	Precipitation.	Temperature.	Precipitation.
	° F.	Inches.	° F.	Inches.		° F.	Inches.	° F.	Inches.
January.....	40.6	5.05	39.8	3.88	August.....	78.3	3.98	79.9	3.45
February...	43.0	4.20	42.3	5.55	September....	72.7	3.03	73.8	2.14
March.....	52.2	5.83	50.8	5.43	October.....	61.2	1.93	62.6	3.60
April.....	61.5	4.77	57.3	3.35	November....	50.6	3.54	49.8	4.08
May.....	70.2	3.50	70.6	2.86	December.....	42.8	4.35	38.7	3.87
June.....	78.0	5.12	78.0	6.10	Year.....	60.9	49.75	60.4	48.15
July.....	79.5	4.45	80.6	3.84					

Dates of first and last killing frosts.

Year.	Florence.		Riverton.		Year.	Florence.		Riverton.	
	Last in spring.	First in fall.	Last in spring.	First in fall.		Last in spring.	First in fall.	Last in spring.	First in fall.
1896.....	Mar. 24	Nov. 9	.....	.....	1902.....	Mar. 20	Oct. 29	Apr. 9	Oct. 29
1897.....	Mar. 26	Nov. 17	.....	Oct. 30	1903.....	Apr. 4	Oct. 25	Apr. 5	Oct. 18
1898.....	Apr. 8	Oct. 27	Apr. 8	Oct. 27	Average..	Mar. 31	Nov. 4	Apr. 6	Oct. 24
1899.....	Apr. 7	Nov. 3	...do....	Sept. 30					
1900.....	Apr. 1	Nov. 9	Apr. 2	Nov. 9					

PHYSIOGRAPHY AND GEOLOGY.

Lauderdale County is located within the physiographic province known as the Tennessee Valley, and presents a variety of surface features which have direct bearing upon the soils and agricultural interests. The elevation ranges from something over 400 feet at the river level to 800 or 1,000 feet on the high ridges along the Tennessee State line, but the descent to the river is by no means gradual; sharp bluffs, from 50 to 100 feet high, mark the inland boundary of the river bottoms, or rise directly from the river, throughout the greater part of its course. From these the country stretches away northward, in the eastern two-thirds of the area, in a broad, gently rolling

plateau, comprising the best-developed farm lands. Into this plateau the larger streams have cut deep narrow gorges, through which they flow in tortuous channels until they emerge from the bluffs. Many of the smaller streams disappear in underground channels through this upland area, and appear as large springs at the base of the bluffs, the bed rock being massive limestone of the St. Louis group (Tuscumbia) of sub-Carboniferous age and of considerable purity, which, when free from chert, gives rise to the Clarksville clay loam soil, or, when mixed with large amounts of chert, to a phase of the Clarksville stony loam.

Beyond this formation a more level plateau, much dissected by erosion, extends nearly to the Tennessee line, where it is broken by a series of rocky ridges rising to elevations of 100 to 300 feet, from which a much broken plateau extends into Tennessee. Through this section the streams flow in wider, shallower valleys, and have formed extensive flood plains, even the smaller streams building some alluvial deposits. Here, also, the descent from the plateau to the stream bottoms is not so abrupt, but progresses by a series of choppy hills with small groovelike valleys extending for some distance each side of the stream. The largest unbroken areas of this second or interior plateau are on both sides of the Cypress Creeks, between Shoal and Bluewater Creeks, and between Anderson and Second Creeks (the easterly one of that name is referred to). This section in general is finely watered by many streams and springs, but the unbroken portion is poorly drained, and embraces what is known locally as the "barrens." The soils have evidently been derived largely from limestone, but rest at no great depth on very cherty beds, which erosion has uncovered in all but the level areas. and in consequence the broken and hilly areas in this section are occupied by a phase of the Clarksville stony loam, in many cases too stony for profitable general cultivation. The level areas are free from stone and occupied by the Clarksville silt loam.

Along Shoal and Bluewater Creeks, in the northern part of the county, rocks of Silurian age (the Pelham [Trenton] limestone and a black coaly shale) outcrop, but have no influence on the soils.

The highlands of the western third of the county present a different aspect from the sections previously described, due to the presence of a more resistant rock—an iron-cemented coarse conglomerate, made up of subangular and rounded pebbles of quartz and chert. These are probably remnants of the Lafayette formation overlying the limestones. The more resistant portions have held up, forming narrow buttressed ridges, while the less resistant intervening places have given way, forming V-shaped valleys, whose slopes are covered with slabs of rock and a large quantity of quartz and chert gravel. These ridges, as already stated, rise to a height of 100 to 300 feet

above the general level of the surrounding country, and are of fantastic shapes and almost mountainous topography. The streams are small but rapid, filling quickly, and often doing much damage to the lower lying country. The soils over this area are also mainly derived from limestone, but are modified by the disintegrated conglomerate and are invariably stony. The almost exclusive type is the least valuable phase of the Clarksville stony loam, little suited to farming operations, except for grazing sheep, goats, and swine, and possibly for growing apples, peaches, and grapes.

Lauderdale County is exceptionally well watered, many large stream systems crossing it in a general north and south direction and emptying into the Tennessee River. Abundant springs of pure water gush from every hill, many of them possessing medicinal properties and others valued solely for the purity of their waters.

SOILS.

The soils of Lauderdale County have been classified in six types, all of which have been mapped in areas previously surveyed. More than half the county is covered by a stony soil, somewhat less than one-fourth by a silt loam, about 22 per cent by a loam and a clay loam, 1 per cent by clay, and less than one-half of 1 per cent by sandy loam.

The following table gives the names and areas of each type of soil shown in the accompanying map:

Areas of different soils.

Soil.	Acres.	Per cent.	Soil.	Acres.	Per cent.
Clarksville stony loam.....	235,712	52.1	Guthrie clay.....	5,376	1.1
Clarksville silt loam.....	104,320	23.2	Clarksville fine sandy loam....	1,856	.4
Clarksville clay loam.....	60,992	13.4	Total.....	453,056	.....
Clarksville loam.....	44,800	9.8			

CLARKSVILLE FINE SANDY LOAM.

The soil of the Clarksville fine sandy loam varies from 6 to 15 inches in depth and is a gray or light orange colored fine sandy loam of loose texture. The subsoil, to a depth of more than 3 feet, is a massive red sandy clay, more sandy in the upper portion, but acting as a clay throughout. The type is generally free from stone or gravel, except in very limited areas.

The largest area occurs about 3 miles northeast of Gravelly Springs and a few narrow belts are found along some of the small streams in the western part of the county, but the extent of this type is very limited and so little is under cultivation at present that it is of little importance.

The surface features are not uniform, but vary from low, rolling hills to narrow valleys. None of the type is too steep for cultiva-

tion. Surface drainage is very complete, but the subsoil is capable of retaining a large amount of moisture, and this combination of texture—a light, loose surface soil, easily cultivated, and a retentive subsoil—should make a very desirable type for special crops. The soil has been largely derived from disintegration and wash from sandy layers of remnants of the Lafayette formation which have been mixed to a certain extent with the clays of the underlying limestone strata. It is thus closely related to the Orangeburg fine sandy loam, and had it occurred in larger, deeper, and better developed areas would have been correlated with that type. The soil is so silicious in character that, except by disintegration, it has undergone little change in the process of formation. The subsoil, being largely derived from limestone, has weathered deeply through solution. It is of a bright red color.

There are no cleared tracts of sufficient size to judge of crop yields or adaptation, but the Clarksville fine sandy loam would seem to be finely suited to peach culture and, where well drained, to cotton, though less productive of corn, small grain, and grass than most of the other soils of the county.

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

Mechanical analyses of Clarksville fine sandy loam.

Number.	Description.	Fine gravel.	Coarse sand.	Medium sand.	Fine sand.	Very fine sand.	Silt.	Clay.
		<i>Per cent.</i>	Per cent.	Per cent.	Per cent.	Per cent.	Per cent.	Per cent.
12630.....	Soil.....	0.1	2.5	10.0	42.7	10.8	25.5	8.1
12631.....	Subsoil.....	.0	3.1	8.4	29.2	6.7	23.1	2.95

CLARKSVILLE CLAY LOAM.

The soil of the Clarksville clay loam, to a depth of 6 to 12 inches, is a brown or yellow loam or silt loam. The subsoil to 24 inches is a yellow clay loam, beneath which occurs a heavy red clay. On the tops of ridges, on eroded slopes, and in a few more level areas the red clay subsoil immediately underlies the brown soil, while on most level areas and at the foot of slopes the yellow subsoil extends to a depth of 3 feet. Both soil and subsoil are free from stone and gravel, except for narrow bands along some slopes.

The Clarksville clay loam occupies a large area in the Colbert bend of the river, extending nearly to the Waterloo Road, east nearly to Cypress Creek, and west almost to Gravelly Springs. Florence is located on another area of the type which reaches east nearly to Shoal Creek. Other areas occur along the Huntsville Road, extending from near the river bluffs several miles into the interior, until they blend with the Clarksville silt loam. A few outliers occur in the latter type.

The surface features presented by the Clarksville clay loam are those of a gentle erosion highland or plateau, with smooth rounded hills, having an average elevation of about 100 feet above the river, and with a gentle slope inland to the southern limits of the Clarksville silt loam. Sink holes and large springs are a feature of the formation, and no streams of any size traverse it. Several cross it by underground channels and emerge as springs. This is the only type of the area in which there is not an abundance of flowing water of fine quality. Wells are numerous, and many sink holes are used as watering places for stock.

Owing to the rolling surface natural drainage is adequate, but both soil and subsoil are capable of holding a good reserve of moisture for the use of growing crops. None of the areas is in need of artificial drainage. Care is necessary to avoid damage from erosion.

The Clarksville clay loam has been derived from massive limestone of the St. Louis group, and weathering has gone on to such an extent as to produce a mellow fertile soil of good moisture capacity, adapted to a wide range of crops in this climate.

Cotton forms the chief crop interest on the Clarksville clay loam, and though it has been cropped continuously for many years it still maintains an average yield of from one-third to one-half bale per acre throughout its extent, much of it producing three-fourths bale. Corn is next in importance and yields from 30 to 60 bushels per acre. Wheat has been recently introduced and gives heavy yields. Quite an acreage has been put out in strawberries, but they are not yet in bearing. Grass and forage crops do well, and a wide variety of garden crops is produced in a small way, not supplying the local demand. Grapes and apples are successfully grown, the vineyards centering around St. Florian, where, in the hands of German colonists, this type of soil has reached a state of productiveness in some measure approaching its possibilities. There is need of a greater diversification of crops, more attention to rotation, and a more general use of cover crops to realize the best from this valuable soil. Continued clean cultivation of cotton and corn has reduced the available organic constituents far below the optimum, and many tests have without exception shown the soil decidedly acid. An increasing acreage of cowpeas bespeaks improvements.

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

Mechanical analyses of Clarksville clay loam.

Number.	Description.	Fine gravel.	Coarse sand.	Medium sand.	Fine sand.	Very fine sand.	Silt.	Clay.
		Per cent.	Per cent.	Per cent.	Per cent.	Per cent.	Per cent.	<i>Per cent.</i>
12626, 12624.....	Soil.....	0.7	4.0	3.2	8.9	7.0	53.7	22.4
12625 12627.....	Subsoil.....	.3	3.0	2.2	5.5	4.7	50.1	34.2

CLARKSVILLE SILT LOAM.

The soil of the Clarksville silt loam ranges from 4 to 8 inches in depth, and is a yellow or gray compact silt loam holding a perceptible amount of very fine sand in the first few inches, which renders it friable when dry. The color is often gray or white and the texture flourlike in a dry condition, but when wet it has a characteristic greenish-yellow color, is plastic, compact, and greasy. The subsoil is a massive yellow silt loam or a silty clay loam resting on a substratum of red clay loam or clay at from 2 to 3 feet in depth, although the yellow subsoil may extend to a depth of 6 to 8 feet in favorable situations. Both soil and subsoil are free from stone or gravel, except small local beds of nodular chert and iron concretions.

This type is developed on the table-lands in the middle portion of the county eastward from Bluff Creek to the Limestone County line and is very uniform throughout the area. Narrow strips extend north into Lawrence and Wayne Counties, Tenn., but it rarely is found close to the river, for topographic reasons. The Clarksville silt loam is essentially a table-land type occurring only in level, gently inclined, or slightly undulating areas. Any abrupt change in elevation is marked by stony areas and such changes in drainage conditions as to produce the Clarksville stony loam or Clarksville clay loam. Depressions and basinlike areas in this type, through further lack of drainage and consequent chemical and physical changes, give rise to Guthrie clay. The yellow color, puddled condition, and excessive acidity of this soil, even in its native state, point to the cause—insufficient drainage—consequent on its natural position and generally level surface, while the presence of the red clay strata, identical with the subsoil of Clarksville clay loam at no great depth, points to its intimate relation with that type and derivation from it through drainage conditions. In undulating areas the red clay often approaches to within 2 feet of the surface, sinking lower as drainage decreases until in the depressions devoid of drainage the type gives way to Guthrie clay.

The Clarksville silt loam has been derived from the solution of many feet of limestone of the St. Louis group and represents the insoluble residue. The iron salts, which give much of the color to soils, are in this case in a lower state of oxidation and produce the distinctive yellow color. Weathering has also been much retarded, and the type is in an acid condition, as well as very deficient in organic matter.

The Clarksville silt loam, or "barrens," as it is widely known from the scant growth of timber it supports, has long been held in poor esteem because of the small returns secured when farmed to cotton in the usual way, and but a small proportion of its area has been cleared. In the last few years it has risen somewhat in popular

estimation, as a few have shown that it responds readily to treatment designed to correct the abnormal conditions already pointed out in this description. Corn and cotton are still the chief crops, and although the average yields are below those obtained on the other tilled soils of the area, a few enterprising farmers are obtaining as good yields as on any other type. Some wheat is grown and medium yields of the finest quality result. When the acidity is corrected good crops of clover are secured. Grass is able to withstand severe drought on this type. Opportunity is unlimited to make of this a fine soil for corn, wheat, and grass by intelligent methods, including rotation, subsoiling, and liming.

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

Mechanical analyses of Clarksville silt loam.

Number.	Description.	Fine gravel.	Coarse sand.	Medium sand.	Fine sand.	Very fine sand.	Silt.	Clay.
		Per cent.	Per cent.	Per cent.	Per cent.	Per cent.	Per cent.	<i>Per cent.</i>
12632-12636.....	Soil.....	0.2	1.5	1.9	9.6	7.2	62.9	16.6
12637-12633.....	Subsoil.....	Tr.	.6	1.2	6.3	4.8	48.8	38.2

CLARKSVILLE STONY LOAM.

The soil of Clarksville stony loam is a brown, gray, or yellow loam or silty loam 6 to 10 inches in depth, underlain by a subsoil of yellowish-red clay loam or stiff red clay to a depth of more than 3 feet, the whole containing from 20 to 60 per cent of angular chert (flint or chalcedony) and occasionally some rounded quartz gravel.

It is the most extensive and widely distributed type of the area, and includes the bluffs along the river and large stream courses, the rough, broken land and cherty knolls, and the ridges in the table-lands, and bears an intimate relation to the other Clarksville types found here. There are three distinct phases of the type, similar except in color and topography, the latter, as affecting accessibility, most influencing the value of the land for agriculture. The most extensive phase has a yellow silty loam soil, with yellowish-red clay loam subsoil, both filled with angular chert. This phase occurs as choppy hills and groovelike valleys bordering the larger streams, and is the result of the erosion by which the present drainage has been established. Another extensive and the least valuable phase occupies large areas, mostly west of Bluff Creek, and is mainly a thin gray loam or silty loam, with heavy yellow and red clay loam subsoil, both containing a large quantity of chert fragments and rounded chert and quartz gravel derived from iron-cemented conglomerate, large slabs and ledges of which are scattered on the surface and protrude from the hillsides. This rock has resisted erosion and solu-

tion, resulting in the formation of narrow, buttressed ridges from 100 to 300 feet higher than the intervening groovelike valleys eroded in the unprotected, less resistant limestone. This section presents the most broken topography of the county, and is sparsely settled and little tilled. The third phase is least extensive and most valuable, and has a brown loam soil and heavy red clay subsoil filled with large angular chert blocks. It occurs as rolling hills along the streams in Clarksville clay loam areas and as narrow ridges of slight elevation within that type. Being more accessible and easily tilled than the rest of the type, it is more largely cleared and under cultivation. The whole type is thoroughly drained.

The Clarksville stony loam is derived from chert beds and layers of limestone. Its stony character is the distinctive feature, the fine earth portion not differing materially from the other Clarksville types in this area.

Cotton and corn are the principal crops, and give only fair returns.

The former will not average one-third bale per acre, while 30 bushels per acre of the latter is considered a fair yield. The type is best suited to the production of fruit, particularly apples, peaches, Kieffer pears, and grapes. Fruit crops are, however, rather uncertain, and few, if any, existing orchards on this soil receive much care. More attention should be paid to setting out apple trees near the foot of slopes in the coves, that they may secure the benefit of soil wash, greater immunity from fungous diseases through better "air drainage," and protection from the summer heat, as this is about the southern limit of successful apple culture. Peaches will do better near the tops of the ridges, and grapes, of course, need good exposure to the sunlight. The timber has been the chief source of revenue from these lands, but little of merchantable value remains.

The following table gives the average results of mechanical analyses of the fine earth of this type of soil:

Mechanical analyses of Clarksville stony loam.

Number.	Description.	Fine gravel.	Coarse sand.	Medium sand.	Fine sand.	Very fine sand.	Silt.	Clay.
		<i>Per ct.</i>	<i>Per ct.</i>	<i>Per ct.</i>	Per ct.	Per ct.	Per ct.	Per ct.
12638-12642.....	Soil.....	1.2	4.1	3.7	7.5	4.4	51.6	27.3
12639-12643.....	Subsoil.....	1.4	3.8	3.8	7.6	3.3	42.5	37.4

CLARKSVILLE LOAM.

The soil of Clarksville loam, to a depth of 10 or 12 inches, is a rich, mellow, dark-brown loam, in which silt is a very prominent constituent. The subsoil is of much the same textural character as the soil, but heavier, and in some cases becoming a silty clay of

drab color. In narrow areas along the smaller streams and near the hills along the river bottoms, where the break from the tablelands is by rounded hills instead of by the usual vertical bluffs, the soil and subsoil contain from 20 to 50 per cent of subangular chert gravel, ranging from small particles up to pieces 2 inches in diameter, and the fine-earth portion is often of a red color. These areas approach the Cumberland loam in texture and crop value, but, being too narrow to be shown separately on the map, have been indicated by gravel symbols. The stream channels and overflow troughs are occupied by pure gravel and worthless for agriculture. Narrow bars of gravel deposited in flood times occur throughout the large creek bottoms. Strips a few yards in width along the river bank are often a fine sand and are used for melon culture.

This type reaches its best development as bottom lands along the Tennessee River, occurring in this county as an interrupted strip from one-quarter to 1 mile in width and covering the islands in the river. Large typical areas have been formed on Cypress, Shoal, and Bluewater Creeks at a distance of several miles from the river and before they cut their narrow gorges through the bluffs to the river bottoms. On the creeks it attains its greatest width at the confluence of the larger tributary streams.

The surface of the Clarksville loam forms a gently inclined plain, higher next the immediate banks of the river, where a strip of fine sand often occurs, and sloping back to the rocky bluffs, at whose bases many large springs emerge, forming sloughs. Where the gravelly phase occurs on small streams the slope is from the base of the hills toward the streams, and where this phase is developed along the river the slope is both from the hill and from the river bank, forming a gentle V-shaped trough. Along the river the average elevation is from 20 to 30 feet above low water and the soil is of great depth, while bordering the small streams the range of elevation is slight and the depth of soil rarely exceeds 3 feet. Here also it is usually underlain by a bed of chert gravel.

The main area of the type is generally well drained for an alluvial soil, but it is traversed by many sloughs and small marsh areas too wet for cultivation. Though loamy in texture, it is capable of holding a large moisture supply. The gravelly phase, locally known as "second bottoms," from its position and large gravel content is more thoroughly drained. Danger from overflow during the growing season is very slight, but the spring freshets on the creeks work many changes, tearing material from one place, ruining the land at that point, and depositing and enriching areas farther down. To lessen this danger, substantial stone walls are frequently built across the creek bottoms to prevent erosion and to induce deposition below by breaking the force of the current on the flood plains. As

a consequence narrow transverse ridges of fine sand are often laid down immediately below these fences and are used as a location for field driveways. The Clarksville loam is mainly of alluvial origin from limestone debris washed down and deposited in time of flood by the river and its tributaries, and the gravelly phase is in part colluvial from the adjacent hills. It consists mainly of fine sediments in a mellow and well-weathered condition and of high natural productiveness.

These bottom lands were originally covered with a heavy growth of canebrake and large timber, but early received the attention of the settlers, and are well cleared and justly famed as a corn soil, producing a heavy growth of stover and yields of grain ranging from 30 to 80 bushels per acre. The gravelly phase, or second bottoms, combines marked productiveness with different drainage conditions. This renders it particularly suited to cotton, for which crop it is the best soil of the area, producing, under intensive cultivation, 1 bale or more per acre through successive seasons and giving high average yields under ordinary conditions of cultivation. Recently more attention has been given to grass and some market-garden crops on this type with much success.

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

Mechanical analyses of Clarksville loam.

Number.	Description.	Fine gravel.	Coarse sand.	Medium sand.	Fine sand.	Very fine sand.	Silt.	Clay.
		Per cent.	Per cent.	Per cent.	Per cent.	Per cent.	Per cent.	<i>Per cent.</i>
12620, 12618.....	Soil.....	0.0	0.2	0.3	1.3	4.1	69.9	24.1
12621, 12619.....	Subsoil.....	.0	.4	.3	2.1	5.6	52.7	38.6

GUTHRIE CLAY.

The soil of the Guthrie clay, locally termed "crawfish" or "pipe-clay" land, to a depth of 6 or 8 inches is a drab, gray, or white heavy silt loam, compact and puddled when wet, but flourlike when dry. The subsoil to 3 feet or more is a gray or yellow, often mottled silt clay, massive, plastic, and impervious. The soil is free from stone and gravel, except for some fine chert fragments and iron concretions in the deep subsoil.

This type occurs in basinlike depressions and in narrow belts around the heads of some drainage systems where there is so little surface inclination that water stands in pools in wet seasons, and its characteristic features are largely due to lack of drainage, for it is a cold, sour soil, of little present value. Tile underdrainage, heavy applications of lime, and the incorporation of coarse organic matter should render it of use in the production of grass and wheat, but the

expense of so improving it is not warranted under existing land values in this section.

The Guthrie clay, originally derived from massive limestone, owes its present condition and distinguishing characteristics to a more recent development of swampy conditions in depressions and in areas of obstructed headwater drainage. Such areas occur in the Clarksville silt loam and the Clarksville clay loam, and its mode of formation is already indicated by its being confined exclusively to those situations.

Bermuda grass seems to be the only successful crop on the type in this area. It is largely uncleared and supports a good timber growth characteristic of such soil, chiefly white oak, post oak, willow oak, gum, hickory, tulip, and some beech. Small areas of from one-quarter acre to 2 acres, occurring in the surrounding types, even when partially drained by ditches, remain unproductive and are usually avoided at planting time. Little improvement can be expected on this soil until the price of surrounding land rises sufficiently to warrant the expense of tile drainage, although Guthrie clay has in it the making of a strong wheat and grass land well suited to stock farming.

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

Mechanical analyses of Guthrie clay.

Number.	Description.	Fine gravel.	Coarse sand.	Medium sand.	Fine sand.	Very fine sand.	Silt.	Clay.
		Per cent.	Per cent.	Per cent.	Per cent.	Per cent.	Per cent.	<i>Per cent.</i>
12622.....	Soil.....	0.0	0.3	0.9	5.9	4.0	64.9	23.7
12623.....	Subsoil.....	.0	Tr.	.5	4.1	2.9	47.0	45.3

AGRICULTURAL METHODS.

The cultural methods in use in Lauderdale County do not differ materially from the general practice throughout the South where cotton and corn form almost the sole crop interests. Plowing is carried only to a shallow or medium depth, insufficient to produce the largest yields or to secure a desirable improvement in the soil texture. In consequence of this practice the implements in use are usually small and light, although a few of the more progressive farmers are using disk plows, harrows, and other modern implements with such marked success that their use is rapidly becoming more general.

Corn is planted in rows about 4 feet apart, leaving but one or two stalks in each hill. On the heavy soils, so general in the area, a heavy growth of stalk is produced, but only the ears and the blades, stripped and cured for hay, are gathered, while the stalk is left standing to be subsequently burned or plowed under before the succeeding

crop is put in. The large, dry stalks are of little benefit to the soil when plowed under, and great saving would result if they were gathered at the proper time, shredded, and fed to stock, returning the manure to the soil.

The fields on which cotton and corn are grown are left bare of vegetation during the winter and exposed to washing and erosion by the heavy rains of that season; whereas they might easily be protected by planting a cover crop, such as cowpeas, barley, rye, or crimson clover, between the rows at the time of the last cultivation, giving an increased annual revenue from the field and conserving the soil energy now so severely taxed.

Systematic crop rotation is the rare exception in this area, and there is great opportunity for improvement of the soils and yields of crops by this means. Attention to this matter can not be too strongly urged, as a continuance of present methods can only result in further impoverishing the soils and diminishing the yields.

Cowpeas are grown to some extent by the best farmers and are recognized as of great value as a soil renovator and as a crop, pea-vine hay being largely used for the work stock and bringing a good price at all times.

The cotton seed is sold to the oil mills and not returned to the fields, as in former times, resulting in a still further drain on the productiveness of the soil, which is met, only where absolutely necessary to produce a paying crop, by the application of small quantities of some commercial fertilizer. When this treatment fails to produce profitable yields, the field is thrown out of cultivation and new land cleared to take its place. A heavy growth of broom sedge, weeds, and scrub trees takes possession of the abandoned fields, making them difficult of reclamation.

Until the last few years little attention has been given to the cultivation of wheat, but the acreage is gradually increasing, and the yields on the Clarksville clay loam are satisfactory, running as high as 25 to 30 bushels per acre. On the Clarksville silt loam the common yield is from 10 to 12 bushels, though it is said the quality of grain on the latter type is superior and commands a higher price.

For all crops except cotton the land is prepared with the turn plow or disk plow and the soil fairly well inverted. For cotton the land is bedded and the preparation and cultivation accomplished with a variety of small tools. Fertilizers are applied in the rows at or before planting. Small quantities, mostly of low-grade mixtures, are used.

AGRICULTURAL CONDITIONS.

By reason of difference in transportation advantages and, to a certain extent, of soil differences, the agricultural population of Lauderdale County falls into two large classes. Settlement first began

and has since expanded largely in that part of the county adjacent to the Tennessee River, because for many years that waterway furnished the best means of transportation, the bulky staple—cotton—could be the more readily marketed, the soils of that district responded more readily to tillage, and the bottom lands, covered with a heavy growth of cane, furnished a fine natural pasturage for the stock. Here the lands have long been well cleared, and the inhabitants thrifty, progressive, and prosperous. The same conditions obtain farther in the interior of the county along the larger stream bottoms.

The greater part of the interior, consisting of level plateaus and stony ridges, is sparsely settled and presents the appearance of a newly settled country. Handicapped for many years by lack of communication and transportation and by the consequent lack of educational advantages, the early settlers in this section have made little progress up to the last few years, and the absence of prosperity is unmistakable. Many of the poorer classes barely eke out a daily existence from the products of the forest and the returns from a small plat of tilled ground. However, changes for the better are rapidly taking place and a great development may be looked for here in the next few years.

Along the river the farms are occasionally worked wholly or in part by the owner, but more often divided into small tracts and rented out for a part of the crops grown, usually a definite number of pounds of lint cotton per acre and a third of the grain and forage produced. In size the farms range from several hundred to several thousand acres, large farms being the rule.

A practice, probably originating in part from early custom and in part from lack of fences, consists in opening the bottom lands for common pasturage after the crops are gathered in the fall, and many head of stock—cattle and mules—are driven down to browse on the cane, stubble, and standing cornstalks, with no care or protection from sudden spells of cold weather, which occasionally visit this latitude in severe winters. Mules when brought out in the spring are said to be in good flesh but soft in muscle, and require grain feed for some weeks before they can be put to work.

Farther inland the farms are generally smaller in size, ranging from a few to several hundred acres in extent, and are worked mostly by the owner. Few cleared areas of any size are found in the interior, and about 5 per cent of the land still belongs to the Government and is open to settlement on complying with the requirements of the Land Office. It should be noted in this connection that most of the Government land now remaining is too rough or stony for profitable tillage, while cleared and improved lands remain at their present low value.

Labor on the large farms is performed mostly by colored help, which is fairly efficient, being particularly suited to the cultivation of cotton, the picking of which gives employment to both sexes and all ages. Labor is scarce in the interior of the county, and is mostly performed by the owner or tenant and members of his family. Some of the northern districts have little or no colored population. Most of the whites there not engaged in agriculture find employment in the various lumbering operations.

The cost of labor, both of men and teams, is cheaper than in sections farther north, as the cost of living is much less in this climate. This fact, more than anything else, has militated against the introduction of improved implements. The average wage for males is 50 cents a day, and for females 30 cents; for services of man and team, about \$2.50.

In point of acreage corn is the principal crop of the area, about 48,000 acres being planted annually, with an average yield over the entire county of 15 bushels per acre. It is grown on every type of soil represented, but the yields vary considerably with the soil and drainage. The Clarksville loam of the river and stream bottoms is the strongest corn soil of the area, closely followed by the Clarksville clay loam. The Clarksville stony loam and Clarksville silt loam are about equal in yield, while the gravelly phase of the Clarksville loam stands very low, because of too thorough drainage, and the Guthrie clay is very uncertain, but makes good yields in favorable seasons.

Cotton is the next crop in relative importance, with an acreage of about 30,000 and an average annual production of 10,000 bales, or, in other words, an average yield of 1 bale from 3 acres over the whole county. It is produced mostly on the Clarksville clay loam and the Clarksville stony loam and on the gravelly phase of the Clarksville loam, or second bottoms, which brings the largest yields, amounting in a few cases to as much as 1 bale per acre. Only a small quantity is grown on the Clarksville silt loam, and practically none on the Guthrie clay.

Wheat is the next crop in importance, and is represented by an acreage of from 5,000 to 6,000 acres annually, with an average yield of about 10 bushels per acre over the county. It is produced mostly on the Clarksville clay loam and the Clarksville silt loam. The former, in a few cases, yields as high as 25 bushels per acre, and the latter, with fertilization, about 12 bushels per acre. The acreage of this crop is gradually increasing, and better yields are being secured year by year.

About 3,000 acres are sown in oats, half of which area is harvested for grain, with an average yield of 10 bushels per acre, while the other half is used for hay, producing about 1 ton per acre. This crop

is grown on all the soils, and the yields are too variable to draw any comparisons between the types.

Millet and Hungarian grass are important crops, and yield over 1 ton per acre, on the average. Potatoes and vegetables are grown only to a limited extent, and do not supply the local markets. Irish potatoes do well, yielding from 50 to 60 bushels, and their production should be largely increased. Sweet potatoes yield about 60 bushels per acre, on the average. About 500 acres each of sorghum cane and cowpeas are grown annually in the county.

Transportation facilities are very poor. The Louisville & Nashville Railroad enters the county near Pruitton on the north and crosses to Florence, where connection is made with the Southern Railroad. The Louisville & Nashville Railroad traverses a rough part of the area, and no towns or shipping points of any size are located on it. The large sections of the area to the east and west of this line are entirely without railroad service, and have communication only by wagon road or ferry with the Southern Railroad, on the other side of the river.

The wagon roads are mainly heavy dirt roads, rutting badly and being deep in mud in wet weather, although keeping in very good condition in dry seasons. Soft chert exists in the hills in great quantities and is easily obtained. It makes a very fine surfacing material, and several of the roads have been improved by this means.

NRCS Accessibility Statement

This document is not accessible by screen-reader software. The Natural Resources Conservation Service (NRCS) is committed to making its information accessible to all of its customers and employees. If you are experiencing accessibility issues and need assistance, please contact our Helpdesk by phone at 1-800-457-3642 or by e-mail at ServiceDesk-FTC@ftc.usda.gov. For assistance with publications that include maps, graphs, or similar forms of information, you may also wish to contact our State or local office. You can locate the correct office and phone number at <http://offices.sc.egov.usda.gov/locator/app>.

The U.S. Department of Agriculture (USDA) prohibits discrimination in all its programs and activities on the basis of race, color, national origin, age, disability, and where applicable, sex, marital status, familial status, parental status, religion, sexual orientation, genetic information, political beliefs, reprisal, or because all or a part of an individual's income is derived from any public assistance program. (Not all prohibited bases apply to all programs.) Persons with disabilities who require alternative means for communication of program information (Braille, large print, audiotope, etc.) should contact USDA's TARGET Center at (202) 720-2600 (voice and TDD). To file a complaint of discrimination write to USDA, Director, Office of Civil Rights, 1400 Independence Avenue, S.W., Washington, D.C. 20250-9410 or call (800) 795-3272 (voice) or (202) 720-6382 (TDD). USDA is an equal opportunity provider and employer.