U. S. DEPARTMENT OF AGRICULTURE,

BUREAU OF SOILS.

IN COOPERATION WITH THE ALABAMA DEPARTMENT OF AGRICULTURE AND INDUSTRIES.

# SOIL SURVEY OF CHOCTAW COUNTY, ALABAMA.

BY

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[Advance Sheets—Field Operations of the Bureau of Soils, 1921.]


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[PUBLIC RESOLUTION—No.9.]

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

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

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

Approved, March 14, 1904.

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

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MAP.

# SOIL SURVEY OF CHOCTAW COUNTY, ALABAMA.

By HOWARD C. SMITH, in charge, and CLARENCE LOUNSBURY, of the United States Department of Agriculture, and J. F. STROUD, of the Alabama Department of Agriculture and Industries.

## DESCRIPTION OF THE AREA.

Choctaw County is situated in the southwestern part of Alabama. The Mississippi-Alabama State line forms the western boundary and the Tombigbee River forms an irregular eastern boundary. The length north and south is 42 miles, and the greatest width east and west is 28 miles.

The county has an area of 912 square miles, or 583,680 acres, and is therefore among the larger counties of the State. The base map was constructed by plane table traverse and the soils were mapped as the base was completed. The original land survey was made about 70 years ago, and along the old Choctaw boundary line, which crosses the county in a northeast-southwest direction, there are many sections that are not of the standard size of 640 acres.

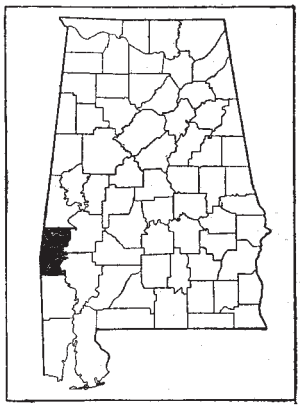

FIG. 33.—Sketch map showing location of the Choctaw County area, Alabama.

Physiographically, the county consists of the remnants of a southward to southeastward sloping plain so thoroughly dissected that little or none of the original surface is left intact. The wide range in the relief of the county is due largely to local variations in this dissection, though in part to differences in the dip of the underlying rock formations.

With respect to erosion and surface features the county may be divided into four main divisions. The first division comprises the rough, broken uplands and steep-sided hills or bluffs underlain by soft and easily eroded limestone or siliceous rocks. This is almost entirely nonagricultural forest land, and its elevations are among the highest in the county. Typical developments of this relief may be seen in the "mountains" to the south of Butler and around Ararat. Here the creeks have a fall of 50 to 200 feet per mile and for the most part flow through rather narrow V-shaped valleys, which lie 100 to 250 feet below the higher hills. The bottoms, which are narrow, contain the main agricultural soil of this division. This region represents the roughest part of the county.

The second division includes about half of the area in the central, central-western, and southeastern parts of the county. From the southeast corner it extends in a northwesterly direction across the county, being quite prominent along the Alabama-Mississippi State line. The surface of this division is rolling to hilly and broken. The valley floors are 100 to 200 feet below the uplands. High and

precipitous bluffs are common; these bluffs are noticeable east and north of Ararat, south of Wahalak Creek, in the vicinity of Butler, and along Gilbertown road. Some of the ridges are very narrow and winding.

The third division embraces the northern end of the county and a small area in the extreme southwestern corner, in all about one-third of the county. This northern and northeastern section lies north of a line extending approximately northwest from Slaters Landing, passing about 2 miles south of Butler, and just below Riderwood, to a point on the State line just north of Cyril. In these localities the upland is gently rolling to rolling, with here and there some comparatively smooth or almost level interstream areas on the broadest divides. This represents the most favorable topography of the uplands. Even in these regions there are steep, eroded slopes bordering the bottom lands, but the streams have not cut so deep, and the level bottom lands are much broader than in the rougher parts of the county. Examples of this rolling topography may be seen around Robjohn, Choctaw City, Pennington, Lavaca, Sunshine School, Halsell, and Lisman.

The fourth division includes the flat to gently sloping terraces and flood plains that occur in broad belts throughout the northern end of the county, and to a less extent in other parts. This division comprises about 25 per cent of the agricultural land of the county. The terraces are approximately 50 to approximately 300 feet above sea level; the elevation of terraces at Gilbertown is 146 feet, and at West Butler, 278 feet. These terraces along the river are broad, undulating second bottoms that have enough slope to provide gradual drainage and lie high enough to escape overflow except in the lower parts at the highest floods. The first bottoms vary from narrow strips to areas 2 miles wide, the largest being along the Tombigbee River. These areas are normally overflowed more or less often each year.

The lowest point in the county is at the southeast corner at the river edge and is only about 10 feet above tide. The following elevations have been determined by the Alabama, Tennessee & Northern Railway: Souwilpa, 148 feet; Gilbertown, 146; Toxey, 122; Bogueloosa, 165; Land, 227; West Butler, 278; Riderwood, 190 feet. The highest elevations are undetermined. Probably the highest point in the county is southeast of Fail, in the southeast quarter of the northwest quarter of section 22, T. 9 N., R. 4 W. The general elevations along the State line are among the highest in Choctaw County.

The Tombigbee River, which flows in a winding course of about 90 miles along the eastern boundary, receives the greater part of the drainage of the county. The drainage is generally southeastward and mainly through Souwilpa, Okatuppa, Talawampa, Puss Cuss, Tishlarka, Wahalak, Tuckabum, and Kinterbish Creeks. The southwest corner of the county is drained by Red and Turkey Creeks. Okatuppa, Turkey, Beaver, Tuckabum, and Kinterbish are the main permanently flowing creeks. The others flow from a few days to several months. With the exception of the first and second bottoms, every part is well drained. On the whole the drainage is excessive. Every farm upon the uplands is connected directly with some drainage system through a stream or through gullies.

Some of the streams have cut nearly to base level, but are still very gradually lowering their channels. The Tombigbee River, for

instance, has a fall of only 3½ to 6 inches per mile. At high water the midstream may flow as fast as 4 miles an hour, but at low water the velocity is only 6 to 10 miles a day.

Formerly there were quite a number of combination gin, saw, and feed mills driven by water power, but with two exceptions these have been supplanted by steam or gasoline driven mills. There are opportunities for the installation of small water-power plants, but the cost of installation is now considered prohibitive.

The determining factor in the location of early settlements was the ease of river transportation, which was the only ready means of shipment for most of the county until 1910, when the Alabama, Tennessee & Northern Railway was built. Until the construction of locks in recent years, navigation was restricted to about half of the year. At present boats make regular weekly trips between Demopolis and Mobile, stopping at all landings. By transfer, shipments may be made to Birmingham and intermediate points on the Alabama and Warrior Rivers.

The county is well served by 25 landings, an average of one to every 3 miles. A number of these, as at Bladon, Coffeeville, and Naheola, are public landings with warehouses attached. Others are privately owned and for the most part without buildings. There are vehicle ferries at Lotts Ferry and Coffeeville Ferry.

The early settlers, who were mainly of English descent, came chiefly from the Carolinas and Georgia, and their descendants constitute practically the entire white population of to-day. Slightly more than half of the population is colored. There has been no immigration from foreign countries and little from other States in recent years.

The present population has a general distribution over the entire county, preference being given to regions of suitable farming land. Before the building of the railroad the population was largely localized around a number of small towns, such as Bladon Springs, Melvin, Mount Sterling, Womack Hill, Pushmataha, Rescueville, Ararat, Isney, Oakchia, and Pennington. After the building of the railroad through the western part of the county, a number of these places were no longer leading centers for local distribution; the river ceased to be largely utilized for passenger traffic, and the freight transportation dwindled.

At present Cullomburg, Silas, Bolinger, Gilbertown, Toxey, Bogueloosa, Land, West Butler, Riderwood, Lisman, and Halsell are the main shipping points with stations on the railroad. Butler, the county seat, is centrally located, 8 miles from the railroad.

Choctaw County was organized by act of the Territorial legislature December 29, 1847. It was formed from parts of Sumter and Washington Counties and is one of the oldest counties in the State. Prior to settlement by the whites, the region was inhabited by the Choctaw Indians.

The population of the county, according to the census of 1920, is 20,753, an increase of 2,270 persons since 1910; the increase in the two preceding decades was only 957. The average density is about 22 persons per square mile.

Lumbering is one of the main industries of the county. The largest sawmills, located at Riderwood and Bolinger, have daily capac-

ities of 100,000 and 40,000 feet, respectively. There also are many portable mills throughout the county. The larger mills have extensive standard-gauge railroads and expect to exhaust their visible supply of timber in from 10 to 15 years. The laborers for these mills have been drawn largely from the farms. A considerable number of farmers till enough land to produce some of the main necessities, and work in the mills during the greater part of the year.

The county roads are for the most part unimproved. The public roads are usually given an annual grading, after which they receive such volunteer attention as is needed to keep them passable. Many of the roads shown on the map as second-class or plantation roads are "timber-cart roads." The roads are usually impassable for automobiles during the winter and during this season can be traversed with light wagons only with difficulty. Surveys and estimates are under way for the construction of improved graded roads to connect the main towns of the county. The main Jackson Highway will traverse the southern part of the county for a number of miles. The county contains no deposits of gravel, but materials for sand-clay construction are available.

A few local telephones are maintained, mostly by cooperating farmers, but there is no county system. Separate graded schools are maintained for both races. There are high schools at Butler, Gilbertown, and Silas.

There are two easily accessible seaport markets, New Orleans for beef cattle, and Mobile for round, squared, or sawed timber, naval stores, and general produce. The western third of the county patronizes the Mobile & Ohio Railroad, across the line in Mississippi. The eastern third of the county relies to a great extent on river transportation for freight shipments of nonperishable products. The bulk of the transportation for the central part is over the Alabama, Tennessee & Northern Railway. Some produce is sold at Meridian, Miss., which is easily accessible from the northwestern part of the county.

The domestic supply of water is easily procured and of good quality. There are few farms of any size that do not have one or more springs, many of which are distinctly mineral. Strong artesian wells are available in the deep valleys of a number of the large creeks.

## CLIMATE.

The climate of Choctaw County is typical of the southern or Gulf region of the State. The mean annual temperature is 64.6° F. and the mean annual precipitation 55.91 inches. The lowest temperature on record is −7° F. The temperature drops to freezing or below on an average of 29 days annually, but seldom goes below 20° F. Freezing cold rarely persists for more than two days at a time, and the ground is rarely frozen to a depth of more than an inch. Periods of frost or freezing are usually followed by several clear, sunny days with brisk winds, followed in turn by increasing cloudiness and rain. Freezing of the soil is an advantage, in that it aids in the control of certain insect pests, especially the cotton-boll weevil. Snow is rare and several years may pass with no snowfall or only a quickly disappearing flurry.

The rainfall is ample for the production of crops; even in the driest year on record the precipitation was near 41 inches. Rainfall is distributed throughout the year, but reaches a maximum in winter and falls to a minimum in the autumn. For the latter season the mean is 9.38 inches. The distribution is therefore somewhat more favorable for the harvesting of crops like cotton and corn than the total precipitation might indicate.

The average dates of the latest and earliest frosts—records of Pushmataha—are March 27 and November 7, thus giving an average growing season for the tenderest vegetation of 225 days, or nearly 7½ months. Frost-resistant plants such as collards, mustard, cabbage, radishes, onions, lettuce, bur clover, and rape, remain green throughout the winter, but usually make slow growth unless planted early enough to attain considerable size before the middle of November. Winter injury to the more hardy vegetables may be prevented by a light covering of pine straw during exceptionally cold spells.

The average annual velocity of wind is 5 miles per hour. The greatest wind movement is in spring, the least in summer. The prevailing winds are from the north in winter, from the south in spring, from the southwest in summer, and northeast in autumn. High winds are rare and do little damage. The air movement during the daytime in summer is usually low, but night breezes favor comfort in sleeping.

Water for domestic use is of exceptional purity and for the most part easily obtained.

The table following, compiled from the records of the Weather Bureau station at Pushmataha, is fairly representative of climatic conditions in the county.

*Normal monthly, seasonal, and annual temperature and precipitation at Pushmataha.*

| Month. | Temperature. | | | Precipitation. | | |
|---|---|---|---|---|---|---|
| | Mean. | Absolute maximum. | Absolute minimum. | Mean. | Total amount for the driest year (1904). | Total amount for the wettest year (1919). |
| | °F. | °F. | °F. | *Inches.* | *Inches.* | *Inches.* |
| December | 47.9 | 83 | 9 | 5.62 | 5.55 | 11.93 |
| January | 47.8 | 84 | 10 | 5.49 | 4.09 | 5.49 |
| February | 49.4 | 86 | −7 | 5.82 | 6.08 | 8.07 |
| Winter | 48.4 | 86 | −7 | 16.93 | 15.72 | 25.49 |
| March | 58.5 | 93 | 19 | 5.50 | 3.16 | 7.41 |
| April | 64.0 | 93 | 28 | 4.68 | 3.22 | 4.22 |
| May | 72.1 | 98 | 38 | 4.88 | 2.26 | 7.73 |
| Spring | 64.9 | 98 | 19 | 15.06 | 8.64 | 19.36 |
| June | 78.8 | 102 | 50 | 4.38 | 3.19 | 2.95 |
| July | 80.6 | 106 | 54 | 5.29 | 5.27 | 5.90 |
| August | 80.3 | 108 | 55 | 4.87 | 3.85 | 14.21 |
| Summer | 79.9 | 108 | 50 | 14.54 | 12.31 | 23.06 |
| September | 75.7 | 104 | 37 | 3.78 | .69 | .00 |
| October | 64.9 | 98 | 26 | 2.41 | .13 | 2.58 |
| November | 54.8 | 88 | 18 | 3.19 | 3.29 | 6.51 |
| Fall | 65.1 | 104 | 18 | 9.38 | 4.11 | 9.09 |
| Year | 64.6 | 108 | −7 | 55.91 | 40.78 | 77.00 |

## AGRICULTURE.

The development of Choctaw County, since its settlement about 100 years ago, has depended on the exploitation of its forest resources and the extension of agriculture. The heavier uplands were the first to be cleared and used for crop production, while the so-called hammock lands, or second bottoms, were next reclaimed. For many years an erroneous impression prevailed that the "piny woods lands," such as the Norfolk, Ruston, and Orangeburg soils, were too sandy and poor for profitable farming. These soils to-day are considered the best in the county, while much of the hillier area, which was first cleared and tilled, has reverted to forest or is used for grazing. The population of the county has always been confined to the uplands or high second bottoms, as the lower lying larger bottoms were considered unhealthful. The early settlers produced corn, wheat, oats, hay, and vegetables, and in addition pork, beef, and mutton. In 1850 the population had increased to 8,389. Cotton was added to the list of crops just before the Civil War, but only a small quantity was produced at this period.

The revenue obtained from turpentine and lumber has been an important source of income, and cutting over or clearing the land of its timber has proceeded much faster than the utilization of this land for agriculture. As a result perhaps one-fourth or one-fifth of the county is now cut-over land, hilly, and not suited to general farming. Cotton has been the important crop for more than 50 years, but the advent of the cotton-boll weevil has caused a change in the cropping systems and a larger acreage is now planted to subsistence crops than formerly.

The agriculture of Choctaw County at present consists of the production of corn as the chief crop and cotton as a cash crop, and of the raising of range-fed hogs and cattle. Until 1919 corn had always been a secondary crop; the acreage ratio was 5 acres of corn to 7 acres of cotton. In that year, however, the ratio changed to about 34 acres of corn to 27 acres of cotton. The average yield of corn, as reported during the survey by a large number of farmers, is around 15 bushels per acre. Large quantities of corn were imported into the county until 1921, when the corn produced was sufficient to meet local needs. The corn is used in making meal for bread and in fattening hogs and feeding work stock and cattle. Hastings Prolific, Georgia Red Cob, Mosby, and Wheatleys Prolific are the principal varieties grown.

Cotton has been and is still the leading cash crop of the county. The yields since the advent of the boll weevil in 1915 have been reduced to one-third to one-fifth of the normal production before this pest appeared. By selecting well-drained sandy soils, using early-maturing varieties of cotton, planting early, fertilizing heavily, and cultivating frequently in order to hasten the crop to maturity before the weevil becomes most destructive, it is still possible to produce cotton profitably. The principal varieties grown are Bank Account, Simpkins Prolific, Half-and-Half, Trice, and Kings Early Improved. Variations in the season, difference in soils, and the kinds and rates of application of fertilizers all have great influence upon the yields of cotton and the damage from the boll weevil.

In addition to corn and cotton, several crops of minor importance are grown in the county. Oats are grown to a small extent as a winter cover crop and for pasturage. Peanuts are produced more or less on nearly every farm, the yields reported being about 16 bushels per acre. Only a few peanuts are sold; most of the crop is used as pasturage for hogs. The use of lime on the sandy soils has been found advisable to insure filling of the pods. The Spanish is the leading variety. Cowpeas were a popular crop until the introduction of the velvet bean. Cowpeas yield from 1 to 2 tons of hay per acre. When the vines are turned under a large quantity of nitrogen and organic matter is deposited in the soil. Velvet beans were introduced into the county in 1914, and since that time their use has spread to nearly every farm. The yield in the pod is about one-half to 1 ton per acre. The Osceola and Early Speckled varieties are grown.

The production of hay has greatly increased since 1916, and is probably about three-fourths of the local requirement. Some of the hay consists of crab grass, crowfoot grass, and a plant locally misnamed "clover." These grasses grow in all parts of the county. On the limy soils in the southwestern part of the county prairie grasses are an important hay crop. Johnson grass, however, does well on these limy soils and constitutes the main hay crop in that locality. Carpet grass and lespedeza make the best pasturage.

Sorgo grows well on every soil except those of the lime belt. It makes an excellent forage when sown thick, cut, and cured at the proper time, or it gives large yields of sirup. The sirup, however, is not considered of as good quality as that obtained from sugar cane. The yields range from 125 to 500 gallons per acre.

Sugar cane is grown extensively and its production could be greatly extended. The light sandy loams with friable and light-colored subsoils produce the lightest colored and best flavored sirup.

According to the census, sweet potatoes were grown on 1,214 acres in 1919. Commercial production of sweet potatoes has not met with success because of inadequate facilities for drying, storing, and marketing the crop. A few farmers raise the Dooley, but Nancy Hall and Porto Rico are the favorite varieties. Potatoes are grown on a small acreage. Two crops of potatoes can be grown in a season.

The garden vegetables grown include cabbage, collards, turnips, tomatoes, squash, okra, cauliflower, lima beans, snap beans, English peas, radishes, lettuce, and parsnips. Some of these, such as turnips, collards, cabbage, and radishes, can be produced during the winter months.

The principal fruits of the county are apples, peaches, and pears. Many of the pear orchards are nearly ruined by blight. The fruit trees are distributed over the county, and there are only a few small commercial orchards.

According to the census, there were 18,696 cattle and 25,228 hogs in the county January, 1920. The cattle are mainly of nondescript breeds. Most of the cattle run upon the open range. The hogs also run at large the greater part of the time, but are penned and fattened before being killed. The meat produced in the county is insufficient to meet local needs. The value of all poultry products in 1919 was $120,629, which exceeded the value of dairy products.

The farmers recognize that there is considerable difference in the soils of the county, particularly with reference to the production of

cotton in the presence of the boll weevil. The fine sandy loams and sandy loams of the uplands are best suited to the growing of cotton under weevil conditions, where it is necessary to have the cotton fruit as early as possible. The bottom lands are considered best for natural grasses, especially for those which afford pasturage for cattle during the greater part of the year. The limy soils are especially suited to Johnson grass and clover. Some of the dark-colored second-bottom and first-bottom soils are adapted to the production of upland rice. The hilly and mountainous uplands are adapted only to forestry, but furnish some forage for cattle during the greater part of the year. The well-drained sandy loams and clays are best suited for corn and oats.

Cultivation is usually shallow. The 1-horse single-stock plow is in general use, and when fitted with different styles of blades is used for all tillage operations. On some farms 2-horse plows are used, the fields being plowed thoroughly before bedding. Tractors have been tried with varying results. Fall or early winter plowing is seldom practiced, but it has been found advisable on heavy clay uplands or soils not overflowed. Fields once plowed and later overflowed are seldom replowed, but are harrowed with a disk, or sometimes planted to corn without further preparation.

Farm dwellings are usually unpainted frame structures of two to four rooms. Many of the tenants live in 1-room or 2-room cabins. The barns are usually ample to give protection for work stock, but not for cows or other stock. Corn fodder and hay are generally stacked near the barns. Rail fences are common, but are being slowly displaced by modern hog-tight wire fences. Nearly all tilled fields are fenced to keep out range stock.

Only a few farmers practice any systematic rotation of crops. The customary alternation between cotton and corn has been changed by the introduction of velvet beans, the growing of which allows a more nearly continuous cropping to corn and cotton or to corn alone, without the usually detrimental effects of a single-crop system. Cowpeas and peanuts are also grown between corn rows. Winter oats are usually followed by cowpeas sown broadcast in June and cut for hay.

The census reports an expenditure of $90,377 for fertilizers in 1919, about 48 per cent of the total number of farms reporting. Home mixtures are being used more than formerly.

Contrary to general opinion, the soils occupying 98 per cent of the county are not high in lime, but are either neutral or distinctly acid. The limy soils are the Sumter clay and Catalpa clay, which cover less than 2 per cent of the area. Outcrops of soft marly limestone are common along many of the larger creeks, and a soft limestone is the surface formation over about 75 square miles of the upland in the extreme southwestern part of the county. These rocks are a convenient source of lime for agricultural use. Lime was formerly used on local farms with good results, and at one time considerable lime was shipped out by boat.

Farm labor is drawn principally from the negro population. Day laborers in 1921 received from 75 cents to $1 a day, with board. Laborers hired by the year have the use of a cabin and garden, with firewood for the cutting, and receive a stipulated quantity of provisions weekly and wages of $15 to $18 a month. Wages are slightly higher in the cotton-chopping season. Negro women receive

from 25 to 40 per cent less than men for similar work. Cotton pickers receive from 50 to 70 cents and velvet-bean pickers about 20 cents per hundred pounds. Less than one-fourth of the farmers employed labor in 1919.

Of the 3,039 farms[1] reported by the 1920 census, 1,129 contain from 20 to 49 acres and are typical 1-horse farms, and 442, including the 2-horse tenant farms, range in size from 50 to 99 acres. Large farms are not numerous, there being only 29 with more than 1,000 acres and 65 with areas lying between 499 and 1,000 acres. The average size of farms is 102.3 acres. Of the total area of the county, about 52 per cent is in farms, and about 37 per cent of the land in farms, or 115,483 acres, is classed as improved land. About 53 per cent of the farms are operated by tenants. On farms rented on a share basis usually half of the cost of fertilizer is paid by each party, and each receives half of all cotton produced.

Land values have a relatively narrow range. Large tracts of non-arable cut-over land covered with a scrubby tree growth are held at $1 to $2 an acre. Very rough land is sold entirely on a basis of its timber value. The price of farm lands depends on the character of roads, tillable acreage, location with respect to towns and railroads, and topography and drainage. The highest priced lands with improvements sell for $15 to $25 an acre.

The table below shows the values of farm property, as reported by the censuses of 1900, 1910, and 1920:

*Values of farm property in Choctaw County, in 1900, 1910, and 1920.*

| Year. | All farm property. | Land in farms. | Farm buildings. | Implements and machinery. | Livestock on farms. | Assessed value of land per acre. | Value of all property per farm. |
|---|---|---|---|---|---|---|---|
| 1900 | $1,730,493 | $810,980 | $383,520 | $93,410 | $151,583 | $2.22 | $603 |
| 1910 | 3,527,544 | 1,818,140 | 738,240 | 188,186 | 782,978 | 5.48 | 1,097 |
| 1920 | 5,512,118 | 2,626,329 | 1,366,954 | 227,605 | 1,291,230 | 8.44 | 1,814 |

The substantial progress of the county is indicated by the above census statistics. The value of all farm property has more than trebled, and the assessed value of land per acre has quadrupled. Even with this great increase, the assessed value of the land is lower than in any other county of the State and about two-fifths of the average for the State. The opportunities for farmers of small means are excellent.

## SOILS.[2]

The soils of Choctaw County are dominantly light colored, the surface soils being chiefly gray, yellowish gray, and light brown. In

[1] In the census each tenancy is enumerated as a farm.

[2] The soils of Choctaw County, Ala., do not join in every place with those mapped in Wayne County, Miss. This is due to a better understanding of the soils and slight changes in classification since the Wayne County area was mapped. These differences are also due in part to the fact that one type or types of soil may be developed in one county and give way to another along or close to the county boundary.

In Choctaw County, the Ruston sandy loam is mapped against the Ruston fine sandy loam of Wayne County, and Orangeburg fine sandy loam adjoins Orangeburg sand, and in other places Susquehanna fine sandy loam borders Orangeburg sandy loam of Wayne County. Also the Guin soils and the Susquehanna clay, hilly phase, are mapped against Susquehanna fine sandy loam of Clarke County, Miss., the Susquehanna fine sandy loam and the Guin soils in places adjoin the Ruston fine sandy loam, the Lauderdale stony clay and the Guin soils adjoin Orangeburg sandy loam, and Sumter clay in Choctaw County is mapped against Houston clay in Clarke County.

the yellowish gray of the Sumter clay there are small spots of almost black soil resembling the Houston clay, while in some of the Catalpa and Ochlockonee soils the surface ranges to a dark brown. As a rule the colors of the soils bear a relation to the amount of organic matter which they contain or to the degree of oxidation or deoxidation of the iron salts present.

Most of the soils are low in organic matter, as this area has been in forest until reclaimed for agriculture. In the existing virgin areas there is in some places a noticeable quantity of vegetable matter in the first inch or two of the soil. This, however, largely disappears after one or two years of cultivation.

Prairie conditions existed only in the limestone region in the southwest corner of the county, and here erosion has kept such close pace with the weathering of the soft limestone that the remains of vegetation have not accumulated, and therefore even in this prairie soil there is relatively little organic matter.

With the exception of the Sumter clay and Catalpa clay, all the soils of the county are either neutral or acid in character. The poorly drained soils are more acid than the well-drained and aerated areas. No free calcium carbonate has accumulated in any of these soils, but the soil in the southwest corner mapped as Sumter clay is highly calcareous. The lower subsoil of the Sumter clay, which is simply a soft, disintegrated limestone, carries 40 per cent or more of lime carbonate.

Leaching of the soluble plant-food elements from these soils has been very pronounced, heavy rainfall, warm temperatures, and open winters favoring this action. Owing in part to this and in part to the character of the formations from which the soils are derived, the soils are relatively low in the elements of plant food. They compare favorably, however, with the soils in this general region of the South, and respond readily to fertilizers and manures.

There are three main groups or classes of soils in the county, and in addition three types of mainly nonagricultural land, shown on the map as the Lauderdale stony clay, Guin soils (undifferentiated), and Meadow.

In the first group are those soils of the comparatively smooth uplands and terraces which are characterized by friable, granular subsoils. These include the Orangeburg, Ruston, Norfolk, Cahaba, and Kalmia types. They occur mainly in the north end and extreme southwest corner and to a less extent in the central part of the county. These upland soils have been derived from the weathering of unconsolidated beds of sand and sandy clay in various mixtures. In these soils there have developed three distinct horizons. First, the surface soil, which is of light texture and structure; second, a layer of lighter colored material slightly heavier in texture than the surface layer; and third, a layer, the true subsoil, of much heavier texture and more compact structure, generally a fine sandy clay to friable clay.

The second group, developed largely in the northwestern, central, and southwestern parts of the county embraces those soils which have decidedly heavy, plastic, or tough clay subsoils, such as the Susquehanna, Leaf, and Chastain types In the Susquehanna fine sandy loam three horizons are developed the surface portion is light in texture, the intermediate layer is slightly heavier, and the third

layer is a heavy plastic clay. This soil has been derived from the weathering of heavy clays. The Susquehanna clay apparently represents material which has undergone only slight weathering, as the raw clay is at or near the surface.

The third class consists of the limy soils, or so-called prairies, developed in the southwest corner of the county and mapped as Sumter clay. Here the soil is residual from the underlying soft limestone or Selma chalk formation. Erosion has kept close pace with weathering, and as a result outcrops of this limestone are common and the raw subsoil is exposed in many places. A representative 3-foot section shows a yellowish-gray surface soil, a creamy-white subsoil, and a soft limestone, which commonly lies within the 3-foot section.

While the texture of the soils of the county is prevailingly of the fine grades, there is a very noticeable difference between the texture of the soils in the southwest corner of the county and those in the north end. Along the Washington County line the texture is medium, but continuing northward it becomes fine and in the north end it is still finer and approaches in many types a very fine sandy or silt loam.

The various soils of the county have been grouped into soil series on the basis of similarity in color, structure, origin, topography, and drainage conditions. Each series is represented by one or more types, which differ from each other in the texture or the relative coarseness and fineness of the surface soil.

The upland soils are included in the Susquehanna, Sumter, Luverne, Orangeburg, Ruston, Norfolk, and Lauderdale series.

The Susquehanna series is characterized by gray to yellowish-gray or red surface soils and a heavy plastic clay subsoil of a mottled red, yellow, and gray color. The types are derived from beds of heavy clay and are well drained and partly eroded. The Susquehanna fine sandy loam, Susquehanna clay, and Susquehanna clay, hilly phase, are mapped.

The Sumter series is markedly different from any of the other series in the county in that the soils are derived from an impure soft limestone, the Selma chalk formation. The surface soil is gray or yellowish gray, while the subsoil has a creamy-white color and rests upon the limestone rock within the 3-foot section. Only one type, the clay, is mapped.

The Luverne series includes types with gray to grayish-brown surface soils, and a bright-red to deep-red, tough, compact but brittle sandy clay subsoil, which in the lower part of the 3-foot section becomes more friable in structure and shades into a yellowish-red color, normally slightly mottled with yellow and containing a noticeable quantity of finely divided mica flakes. It is the tough and compact structure of the subsoil which differentiates this series from the Orangeburg. The fine sandy loam is the only type mapped in the county.

The types of the Orangeburg series have gray to grayish-brown surface soils and a red sandy clay subsoil. Only the fine sandy loam is mapped in Choctaw County.

The Ruston series comprises types with light-brown to grayish-brown surface soils, underlain by a subsoil of yellowish-red to reddish-yellow, friable sandy clay. The Ruston sandy loam and fine sandy loam occur in Choctaw County.

The types of the Norfolk series have gray surface soils and a yellow sand or friable sandy clay subsoil. The Norfolk fine sand and fine sandy loam are mapped in this county.

The types included in the Lauderdale series have grayish to whitish surface soils and a whitish to creamy yellow and in some places reddish clay subsoil. Usually the light-colored siliceous rock, the Tallahatta buhrstone of the Claibourne formation comes within 2 feet of the surface and even outcrops in many places. This rock, resembling limestone but containing practically no lime, has weathered unevenly and has given rise to the variable soil mapped as Lauderdale stony clay.

The Guin soils (undifferentiated) represent spots of Orangeburg, Ruston, Norfolk, Susquehanna, and Lauderdale soils so intricately mixed that it was impracticable to separate them into individual types. The surface is prevailingly rough and broken and the land is largely nonagricultural.

The alluvial soils are divided into first-bottom and terrace soils. The first bottoms include those low flood plains which are at present subject to overflow and are being modified by the deposition or removal of material at each overflow. The second bottoms or stream terraces comprise the old alluvium or flood plains which are no longer overflowed, although some areas are subject to inundation at extremely high floods. Since these materials were deposited considerable changes have taken place owing to oxidation, aeration, and leaching. Extensive areas of these second bottoms or terraces are developed in the north end and to a less extent in other parts of the county. The character of these soils depends largely upon the upland soils, from which the bottom soils are washed.

The soils of the second bottoms, or terraces, have been correlated with the Cahaba, Kalmia, Leaf, and Myatt series. The Cahaba series has grayish-brown to brown surface soils and a reddish-yellow rather compact subsoil. Only the Cahaba fine sandy loam is mapped. The Kalmia series has gray surface soils and a yellow friable subsoil. The fine sandy loam and fine sand are developed in this county. The Leaf series is characterized by gray surface soils and a mottled red, yellow, and gray, plastic clay subsoil. The fine sandy loam and the clay are represented. The Myatt series has dull-gray surface soils and a gray or mottled yellowish and gray, friable to tough subsoil. This series occupies the poorly drained areas of the terraces. Only the fine sandy loam is mapped.

In the first bottoms are developed the Ochlockonee, Chastain, and Catalpa series. The Ochlockonee series has brown to grayish-brown surface soils and a brown or mottled gray and brown subsoil. Two types, the fine sandy loam and the clay, were mapped. The Chastain series is similar to the Leaf, except that it occurs in the first bottoms. Only one type, the clay, is represented. The Catalpa series differs from the other first-bottom series in that the material is derived largely from the Sumter clay and is calcareous. This series embraces heavy clays of brown color over a drab-colored plastic clay subsoil. Only the clay type is mapped.

Meadow represents material in the first bottoms so variable in texture, color, and structure that it could not be classified into series and types.

In the subsequent chapters the various types are described in detail and their crop values and adaptations are set forth. Their distribution is shown on the accompanying soil map.

In all, 20 different types of soil, one phase, Guin soils (undifferentiated), and Meadow were recognized and mapped in the county. The following table gives the actual and relative extent of the types:

*Areas of different soils.*

| Soil. | Acres. | Per cent. | Soil. | Acres. | Per cent. |
|---|---|---|---|---|---|
| Ruston fine sandy loam | 91,456 | 15.7 | Orangeburg fine sandy loam | 13,632 | 2.3 |
| Guin soils (undifferentiated) | 64,704 | 11.1 | Chastain clay | 8,000 | 1.4 |
| Susquehanna fine sandy loam | 62,464 | 10.7 | Cahaba fine sandy loam | 7,872 | 1.3 |
| Susquehanna clay | 28,416 | 10.0 | Myatt fine sandy loam | 6,208 | 1.1 |
| Hilly phase | 29,504 | | Sumter clay | 5,888 | 1.0 |
| Lauderdale stony clay | 51,968 | 8.9 | Ruston sandy loam | 4,160 | .7 |
| Kalmia fine sandy loam | 35,008 | 6.0 | Norfolk fine sandy loam | 3,008 | .5 |
| Ochlockonee fine sandy loam | 34,496 | 5.9 | Kalmia fine sand | 2,688 | .5 |
| Meadow | 33,216 | 5.7 | Leaf clay | 1,856 | .3 |
| Ochlockonee clay | 28,288 | 4.8 | Catalpa clay | 1,856 | .3 |
| Luverne fine sandy loam | 27,392 | 4.7 | | | |
| Leaf fine sandy loam | 24,640 | 4.2 | Total | 583,680 | |
| Norfolk fine sand | 16,960 | 2.9 | | | |

SUSQUEHANNA FINE SANDY LOAM.

The surface soil of the Susquehanna fine sandy loam consists of 4 to 8 inches of light-gray to pale yellowish gray loamy fine sand, underlain by 1 to 3 inches of yellow fine sandy loam. The subsoil begins as a dull-red, heavy, plastic clay, which, at 10 to 20 inches, is mottled red, yellow, and gray, the yellow and gray increasing with depth and preponderating in the lower part of the 3-foot profile.

There are a few notable variations from this type description. In the northern end of the county, for example, the surface soil has a relatively high content of very fine sand and silt, approaching closely in texture a very fine sandy loam. Throughout the type on slopes and knolls the sandy surface soil has been removed or has not accumulated and the dull-red clay is exposed. Where this type is closely associated with the Orangeburg and Luverne soils it may include spots of these soils, particularly near Sunshine School and Hopewell Church. In the central and southeastern parts of the county this type appears to be influenced by the underlying siliceous rock, and the subsoil in a few places grades into the light-colored clay or the weathered rock at depths less than 3 feet. In the southwestern part of the county the type in a few places is underlain by a stratum of fine sand or fine sandy clay at depths of 3 to 8 feet.

The Susquehanna fine sandy loam has the widest distribution of any of the upland soils in Choctaw County. It occurs in almost every township. The largest areas lie in the northern half of the county on the watersheds of Tuckabum, Yantley, Clear, and Kinterbish Creeks.

The surface varies from gently rolling to rolling, broken, and hilly, but the type is not as rough as the Susquehanna clay. In the northeastern part of the county there are some broad gently rolling areas having somewhat the appearance of old terraces. These represent

the smoothest part of the type. The roughest lie around the heads of streams, as on the South Prong of Mill Creek. A few areas occupy narrow winding ridges or divides that have very steep slopes. The natural surface drainage is excellent, but water does not move rapidly through the heavy clay subsoil. Erosion is very active upon the cleared areas of this type, and even in a few years a smooth hillside, unless protected, may be completely ruined through the formation of gullies.

A considerable part of this type is under cultivation. At least one half of the entire area could be cultivated with safety, provided care be taken to prevent gullying and erosion. This soil was originally known as "oak and hickory land" on account of the prevalence of these trees. The present forest growth consists mainly of loblolly and shortleaf pine, with scattered longleaf pine, oaks of several species, some hickory, chinquapin, and magnolia.

Corn, cotton, and velvet beans are the principal crops. The crops of minor importance are sorgo, sugar cane, peanuts, cowpeas, sweet potatoes, and oats. The yields of corn range from 8 to 15 bushels, velvet beans from one-fourth to three-fourths ton, peanuts from 20 to 50 bushels, and sweet potatoes from 100 to 200 bushels per acre. Land of this type sells at $5 to $20 an acre.

For the improvement of this soil the incorporation of organic matter is of first importance. It is also important to prevent gullying and erosion, and this can be done by terracing and by keeping some crops growing on the land during the winter months. The subsoil of this type is comparatively high in plant-food elements and there is no reason why this soil can not be built up and maintained in a fair state of productiveness. The same fertilizer practice is required for this type as recommended for the Ruston fine sandy loam.

### SUSQUEHANNA CLAY.

The Susquehanna clay is locally known as the "piny woods prairie" or "oak and hickory land." The surface soil of the Susquehanna clay consists of 2 or 3 inches of brown or grayish-brown fine sandy loam which passes into a layer of a few inches of dull-brown to reddish fine sandy clay or clay loam. The subsoil begins as a dull-red, compact, plastic, sticky clay, which below about 15 to 18 inches is a mottled red, yellow, and gray, heavy, plastic clay. In places the subsoil below 30 inches is a mottled gray and bluish clay. Here and there iron concretions occur throughout the 3-foot section, and a few mica flakes also are present.

There are many variations in the surface soil of the Susquehanna clay. In some places the upper layer of fine sandy loam is wanting and the clay of the subsoil is exposed. There are a few patches of gray silt loam in what is known as the "post oak flats" region. East of Edna the surface carries a few platy fragments of sandstone. The type is especially variable about 3 miles northeast of Butler, as there are knolls of sand or fine sandy loam scattered throughout the areas of clay. In this locality the subsoil consists of gray and yellow laminated clays, with alternating layers of light-colored sandy material interspersed with red clay.

The largest areas of Susquehanna clay are in the northeastern part of the county in the vicinity of Edna; other large areas occur on the broad slopes of the larger creeks in the northern half of the county. With the exception of a few scattered areas, such as those west of Cullomburg and south of Isney, only a few small patches of this soil are developed in the southern half of the county.

The surface of the Susquehanna clay varies from gently rolling and rolling to broken and hilly. The type occupies nearly as high positions as the Norfolk, Ruston, Luverne, and Orangeburg soils in the western half of the county, and along the Mississippi-Alabama line. The areas of this type east of Edna lie relatively low. Much of the type is developed on narrow, winding ridges and knolls. The areas bordering the branch heads have many shallow V-shaped gullies and steep slopes. Where the surface of this type becomes very hilly, broken, and rough it has been classed as a hilly phase. The surface drainage is generally excessive, but the drainage of the subsoil is very slow, owing to the impervious nature of the clay.

Although the Susquehanna clay is extensive, it is not an important type from an agricultural point of view. A very small proportion of this soil is under cultivation. On fields once in cultivation erosion has been very active. Many fields were abandoned 20 to 50 years ago, because of erosion and difficulty of cultivation. Practically all the virgin timber has been cut. The second growth comprises shortleaf and loblolly pine, together with post oak and a few trees of gum, magnolia, hickory, dogwood, red, black, and white oak. In forested areas the pasturage is very scant. As a rule the yields of corn, velvet beans, and cowpeas are low. The soil is cultivated with difficulty, owing to its heavy texture and compact structure. The pasturing of cattle on the rougher areas, which began many years ago, has gradually spread until nearly all the type is in pasture or in forest.

The Susquehanna clay at present is very sparsely populated. Land of this type sells for $2 to $5 an acre, depending upon its timber growth or its value for pasture. The smoother parts of the type should either be used as pasture land or forested, and the slopes and eroded areas should be used only for forestry.

*Susquehanna clay, hilly phase.*—The hilly phase of the Susquehanna clay comprises those areas of the type that are too rough, steep, and broken to be used for agriculture. Some of the smoother parts of this phase were cultivated at one time, but have been ruined by erosion. The soil is a dull-red clay which passes at about 8 to 15 inches into a mottled yellow, gray, and red plastic clay. A few ironstone or shalelike fragments appear in this soil north of Butler and Riderwood. As mapped the phase includes a few rough, broken areas of Susquehanna fine sandy loam and eroded areas of Ruston, Orangeburg, and Guin soils.

This phase occupies the rough, higher hills and steep slopes on the south of Wahalak Creek, 2 miles south of Butler. Some of the largest areas are developed around Lingo Mountain, 5 miles southeast of Butler and in that general locality; others lie north of Butler. All this phase should be devoted to forestry or used as grazing land. Where the timber has been cut this land can be bought for $1 to $2 an acre.

SUMTER CLAY.

The surface soil of the Sumter clay consists of gray to yellowish-gray clay having an average depth of 4 to 6 inches. The subsoil is a pale yellowish gray to creamy-white heavy clay which passes at 15 to 30 inches into a dry, crumbly, disintegrated or partly weathered soft limestone.[3]

On many areas subjected to long continued but moderate erosion the soil has been entirely removed, exposing the raw subsoil or rotten white limestone. On flat interstream areas, not eroded and rather wet, the soil in patches is dark enough to be classed as Houston clay. As mapped the type includes small patches of Oktibbeha clay and of some other soils, particularly where cut by streams, as in the southeast quarter of section 15, and the southwest quarter of section 14, T. 9 N., R. 5 W.

When wet the soil is very plastic and sticky and impossible to plow or cultivate. Under proper moisture conditions it crumbles to a good tilth. In cultivated fields in dry weather the soil may crack perceptibly.

This type is developed in the southwest corner of the county. Typical bodies lie in section 36 and in the southern part of section 25, T. 10 N., R. 5 W., 2 miles east of Isney, and south of Melvin in sections 23 and 26.

The Sumter clay occupies broad crests of divides whose sides slope gently to the streams, which flow through narrow deep valleys. In the eastern half of section 23, T. 11 N., R. 5 W., the surface is very rough and the land is suited only for pasture. This type is naturally well drained, as all the surface is gently rolling to strongly rolling. Erosion is very active and has formed many gullies.

The Sumter clay supports a varied forest flora. The more plentiful trees include cottonwood, cedar, hackberry, and a number of oaks.

When first cleared the Sumter clay was a strong soil, and all tillable parts were soon brought under the plow. But owing to lack of care, the soil soon washed away and the surface became so eroded that the production of cultivated crops largely ceased. Less than 10 per cent of the type is now tilled. On this area under most favorable conditions, corn may yield 15 to 20 bushels per acre. Only one field of cotton was noted in 1921. This yielded well, but the season was unusually dry and the bolls ripened early.

Pasture grasses and certain legumes, among them Johnson grass, sweet clover, and other clovers, have taken possession of the land and its chief value lies in these plants, which are useful for both pasturage and hay. A legume (*Chamaecrista robusta*), which resembles the partridge pea and beggarweed, also is generally considered valuable for hay. The grass *Sorghastrum nutans* yields from 1 to 2 tons per acre from two cuttings.

The land of this type should be protected by terracing and other measures to prevent washing, as its value, already greatly lowered, is being destroyed by further erosion. The smoother areas could be reclaimed and devoted to alfalfa. The type supports cattle in better condition, especially during the winter, than the sandy upland types. It is valued at $6 to $12 an acre.

[3] A typical sample of the partly weathered lower subsoil showed 48 per cent of lime carbonate.

### LUVERNE FINE SANDY LOAM.

The surface soil of the Luverne fine sandy loam consists of 4 to 6 inches of brown to grayish-brown loamy fine sand, underlain by a yellow or brownish-yellow loamy fine sand or light fine sandy loam extending to a depth of 10 to 15 inches. The subsoil is a bright-red, to dull-red, very compact, tough, slightly plastic clay, which at 24 to 30 inches grades into a clay that is light-red slightly mottled with yellow, contains a considerable proportion of mica flakes, and has a more friable structure than the upper subsoil. The principal difference between the Luverne fine sandy loam and the Orangeburg fine sandy loam is in the compact but brittle structure of the subsoil of the former as compared with the friable structure of the latter. The subsoil of the Luverne has the tendency to crack into roughly cubical fragments upon drying, whereas the subsoil of the Orangeburg crumbles to a friable, mealy mass.

Erosion is active on some of the slopes and this accounts for considerable variation in the depth, color and texture of the surface soil. In some places the sandy covering has been removed leaving a tough clay at the surface; in other places there is an accumulation of fine sand. Where the clay comes near the surface the color of the surface soil is usually reddish brown to light red, and where the sandy covering is comparatively deep the color is gray to light brown. The content of sand in the subsoil is low, but is greater below 24 to 30 inches. It is this sand and the mica that render the lower subsoil more friable than the upper part. Included with this type are a few patches of Orangeburg fine sandy loam, Ruston fine sandy loam, and Susquehanna fine sandy loam. About 4 miles northeast of Butler the subsoil is light red and closely resembles the subsoil of the Orangeburg.

This type occurs in fairly large areas about 2 miles east of Butler, south of Mount Sterling, in the vicinity of Isney, northeast of Isney, and at Old Bethel Church. One large area lies east of Silas on the road to Black Creek Church.

The Luverne fine sandy loam has a gently rolling to rolling surface. There are a few steep slopes, but most of the type occupies high, flat tops or gently rolling interstream areas. The erosion upon this type is smooth as compared with the vertical erosion of the Orangeburg, Ruston, and Susquehanna soils. Probably 80 per cent of this soil occupies a favorable topography for the use of improved machinery. The natural surface drainage is good, being somewhat excessive on the steeper slopes. The subsoil drainage is hindered to some extent by the compact structure, and the rainfall is absorbed more slowly on this type than on the Ruston or Orangeburg types, but more rapidly than upon the Susquehanna types. The soil probably withstands extremes of wetness or dryness better than any of the other types mentioned.

About three-fourths of this type is under cultivation and more of it could be safely cultivated. The timber growth is similar to that on the Ruston fine sandy loam. The pasture grasses are equal to those upon any of the upland types and some of them afford a longer grazing period than upon the lighter soils of the county.

The Luverne fine sandy loam is used principally for growing corn, velvet beans, and cotton. The yields of these crops are slightly higher

than those given for the Orangeburg fine sandy loam or Ruston fine sandy loam. Subsistence crops, such as sorgo, sugar cane, oats, peanuts, and chufas do well. Part of the velvet-bean crop is harvested for seed and the rest is pastured. Some peanut vines are cut for hay. The tillage methods and fertilizers used on this soil are similar to those upon the Orangeburg and Ruston soils.

This soil can be improved by growing and turning under velvet beans or soybeans. Peanuts also will improve the land, provided they are hogged off and the vines plowed under.

The table below gives the results of mechanical analyses of samples of the soil and subsoil of the Luverne fine sandy loam:

*Mechanical analyses of Luverne fine sandy 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.* | *Per cent.* |
| 416541 | Soil, 0 to 8 inches | 1.6 | 7.8 | 3.6 | 42.0 | 29.6 | 11.1 | 4.0 |
| 416542 | Subsoil, 8 to 36 inches | 1.4 | 7.4 | 2.8 | 13.0 | 26.9 | 11.4 | 37.1 |

ORANGEBURG FINE SANDY LOAM.

The surface soil of the Orangeburg fine sandy loam is a grayish-brown to light-brown fine loamy sand passing at about 6 inches into a yellow or brownish-yellow loamy fine sand or fine sandy loam, which extends to a depth of 10 to 15 inches. In the forested areas the light-brown surface may not be more than an inch or two deep, and it contains a slightly larger amount of organic matter than is present in the surface soil in the cultivated fields. The subsoil is a dark-red to red friable fine sandy clay extending to a depth of 3 feet or more. Usually at about 4 or 5 feet this material gives way to a mottled yellow and red sandy clay. In many places the subsoil of the type resembles in general appearance that of the Luverne fine sandy loam. The principal difference between these subsoils is that the Orangeburg is distinctly friable while that of the Luverne is decidedly tough and compact.

This type has a small development in the county and is distributed in small areas. These are somewhat more numerous in the extreme southwestern corner of the county than elsewhere. Relatively important areas are situated at Cullomburg, on the high divide between Okatuppa and Bogueloosa Creeks, and between Camp Ground Church and Riderwood.

The Orangeburg fine sandy loam has a gently rolling and sloping to steeply rolling topography. It occurs mainly on the crests of long, narrow, winding ridges, like those at Tabernacle Church, 2 miles south of Paragon, and on knobs like those near Fail and West Point Church and north of Hinton. The greater part of the type has a surface favorable for farming, but a part of it has very steep or precipitous slopes and is nonagricultural land. The drainage is good to excessive. Terracing is essential to prevent washing on the slopes.

The present forest growth consists of longleaf, shortleaf, and loblolly pine, together with a few oaks and other hardwood trees. Lespedeza, carpet grass, and broom sedge are the usual grasses on the pasture

lands. This is one of the best soils of the county, and practically every crop grown yields well. Peaches, especially the Mayflower, Elberta, and Belle of Georgia, are well adapted to this soil. Pears and figs also do well. The crops grown, the yields obtained, and the fertilizer requirements on this soil are similar to those on the Ruston fine sandy loam. This soil can be built up to a fair state of productiveness. It is highly prized in other parts of Alabama.

### RUSTON SANDY LOAM.

The surface soil of the Ruston sandy loam is a light-brown to grayish-brown loamy sand passing at 2 to 6 inches into a reddish-yellow, light sandy loam which extends to a depth of 12 to 20 inches. The subsoil to a depth of 36 inches or more is a yellowish-red to reddish-yellow or pale-red friable sandy clay. In a few places the soil contains noticeable quantities of small iron pebbles and flat, platy fragments of sandstone locally known as "iron rock." From the Washington County line northward the texture of this type gradually becomes finer until it merges into the Ruston fine sandy loam.

This type occupies a small area in the extreme southwest corner of the county along the Washington County line. It occupies gently rolling to rolling areas and is naturally well drained. Erosion is noticeable in many areas, and deep gullies have been formed in places.

Perhaps 80 per cent of this type is cleared and under cultivation. It is considered one of the good farming soils of the county. The yields are as high or higher than upon the Ruston fine sandy loam. Practically the same crops are grown and the same fertilization and cultural methods are practiced on this type as on the fine sandy loam.

### RUSTON FINE SANDY LOAM

The surface soil of Ruston fine sandy loam, in forested areas, is a brown loamy fine sand to a depth of 2 to 3 inches, where it passes into a yellowish-gray or pale-yellow loamy fine sand to light fine sandy loam. In cultivated fields the surface soil has a gray to light-brown color to a depth of about 5 to 8 inches where it passes into yellowish-gray loamy fine sand. The subsoil, beginning at a depth anywhere between 12 and 20 inches, is a yellowish-red to reddish-yellow or yellowish-brown fine sandy clay, which generally extends to a depth of 3 feet, but in places becomes lighter in color and more mottled below 24 to 30 inches. The more uniform color of the subsoil in the higher lying areas is probably due to more thorough oxidation of the iron salts.

In a belt about 5 or 6 miles wide beginning about 2 miles south of Lisman and extending northeast and also northwest, the surface soil carries a relatively high percentage of very fine sand and silt, giving it a somewhat more loamy texture. In many places the subsoil is compact and slightly plastic, particularly along contacts with the Susquehanna soils. In spots the subsoil resembles the subsoil of the Luverne series, and in other places the subsoil of the Ruston grades off toward that of the Norfolk.

The Ruston fine sandy loam occupies 15.7 per cent of the area of the county and is the most extensive soil in the county. It is developed more or less extensively in nearly every township. The largest areas extend from Paragon southeast to Barrytown. Large areas lie near Black Creek Church. The greater part of the type, however, is distributed over the northern end of the county.

The topography varies from gently rolling to hilly. Upon some of the more gently rolling or nearly level areas the surface has somewhat the appearance of an old terrace. The surface is smoothest on the broad interstream areas and becomes broken as the streams are approached. South of Butler some of this type occupies the ridges, and erosion has been very active, with the formation of deep V-shaped gullies and exposure of the Buhrstone rock beds. In the northern half of the county approximately 60 per cent of the type can be cultivated with safety, while in the southern half not more than one-fourth is suited to farming, owing to the rolling topography and the danger of erosion. The natural surface drainage is good to excessive. The subsoil drainage is always good, as the subsoil is open and friable. Terracing is essential on the slopes in order to prevent the formation of deep gullies.

More than half of this type is in forest or has been cut over in recent years. Most of the forest standing to-day is second growth. The reforested areas have a growth of old-field and loblolly pine, together with small oaks and a few chinquapin, gum, dogwood, and persimmon trees.

The Ruston fine sandy loam is one of the better upland soils of Choctaw County and more of it is under cultivation than of any other type. Practically all crops common to the region, except those requiring a lime soil, are produced upon it. Cotton, the leading crop, yields from one-fourth to one-half bale per acre when liberally fertilized and properly cultivated. Corn yields from 10 to 20 bushels per acre, and more when given heavy applications of manures and fertilizers. Sweet potatoes produce 100 to 300 bushels per acre. Peanuts, velvet beans, cowpeas, and sorgo do well. Sugar cane yields 100 to 200 gallons of sirup per acre. The sirup is of fair color and good quality, though not quite as light as that produced on the Norfolk and Kalmia soils. Apples, peaches, pears, plums, and Muscadine grapes are grown with moderate success. Practically all kinds of garden vegetables, and also strawberries and dewberries, are successfully and profitably grown. Commercial fertilizers are used more or less on all crops, and some barnyard manure is applied. Usually about 200 to 400 pounds of an 8–3–3 or 10–2–2 mixture is used per acre.

Land of the Ruston fine sandy loam type brings from $5 to $30 an acre. The price is influenced by the character of the topography, as well as by location and improvements.

The soil is easy to till, warms up early in the spring, and responds readily to fertilizers and manures. Like all of the upland soils of the county, it is low in organic matter. Under existing conditions this can best be supplied by growing and turning under soybeans and cowpeas. When green-manure crops are turned under it would be well to give the soil a light application of lime to correct acidity.

The soil can be built up to a fair state of productiveness and maintained in this condition economically.

### NORFOLK FINE SAND.

The surface soil of the Norfolk fine sand is a light-gray or yellowish-gray fine sand, with a depth of 5 or 6 inches. In wooded areas the surface inch or two may contain enough organic matter to give it a dark-gray or brownish color. The subsoil is a light-yellow loose fine sand, which extends to the depth of 3 feet or more, or in some places becomes slightly paler, almost white in color in the lower part of the 3-foot section. In some of the flatter areas the lower subsoil may be slightly mottled with gray.

In a few places in the central and southern parts of the county, especially to the north of Bolinger, the texture is coarser, and had they occupied larger areas such spots would have been mapped Norfolk sand. Northwest of Melvin in places the sand is somewhat loamy in character and overlies white limestone. Near Little Souwilpa Creek a few spots of old eroded terrace have been mapped as Norfolk fine sand. This type also includes spots of Ruston fine sand or loamy fine sand, particularly about 3 miles east of Hinton and southwest of Riderwood.

The Norfork fine sand occurs in small areas distributed over all parts of the county except the northern end. Much of the type occupies knolls or winding ridges, such as those between Liberty Church and Gibson Mill and along the road from Water Valley to Melvin. It is developed on Womack Hill, 2 miles south of Paragon Church, near Wimberly, 2 miles west of Riderwood, and south of Missala on the State line.

In some places vertical gullies have formed, and some fields have been abandoned on this account. All this type is exceptionally well drained both on the surface and internally. The areas on some of the knolls and ridges are excessively drained and the crops there suffer from lack of sufficient moisture in midsummer. On the contrary the flatter areas of this sand may become water-logged during wet seasons, and crops may be damaged by an excess of moisture.

The Norfolk fine sand is fairly well settled and about one-third of it is in cultivation. A considerable part has been abandoned recently and is reverting to forest. The type originally supported a magnificent stand of longleaf pine and was locally called "piny woods land." Most of the merchantable timber has been removed, and the cut-over lands or reforested areas have a growth of loblolly or shortleaf pine, together with various oaks, some sweetgum, sourwood, holly, sassafras, and persimmon, and a little chestnut and chinquapin.

Cotton, corn, velvet beans, peanuts, and sugar cane are the most important crops grown on this soil. Apples, pears, peaches, and figs are grown for home use. Cotton matures earlier on this soil than upon any other in the county, but the yields are extremely low, unless the crop is heavily fertilized. Corn yields 5 to 8 bushels without fertilizer and 10 to 15 with the ordinary fertilizer applications. Peanuts yield 600 to 800 pounds of hay and 15 to 50 bushels of nuts. The percentage of "pops" or unfilled nuts is high, owing, it is believed, to a deficiency of lime and phosphate. Watermelons and garden vegetables do well.

The Norfolk fine sand is easily handled. It needs organic matter and lime, together with barnyard manure or commercial fertilizers, to produce profitable crops. The growing of cowpeas and rye or

velvet beans and turning these under in the green state will increase the supply of nitrogen, as well as improve the structure of the soil.

### NORFOLK FINE SANDY LOAM.

The surface soil of this type is a light-gray or yellowish-gray loamy fine sand passing at 3 to 6 inches into a pale-yellow loamy fine sand, which extends to a depth of 10 to 15 inches. In the forested areas, and in the cultivated areas where considerable barnyard manure or green manure has been turned under, the surface soil is gray or brownish gray, but in some of the fields long cultivated and in abandoned fields the surface is almost white. The subsoil is a yellow fine sandy clay of friable structure.

This is one of the less extensive soils of the county. It occurs in small areas, some of the largest of which lie about 2 miles northeast of Black Creek Church and northeast and northwest of Bolinger. It has a smooth to gently sloping surface and good natural drainage.

Most of this type is cleared and under cultivation. The crops grown, the yields obtained, and the methods of fertilization and cultivation, and also the methods for improving the land are practically the same as those for the Ruston fine sandy loam. The principal difference between this type and the Ruston fine sandy loam is in the color of the subsoil.

### LAUDERDALE STONY CLAY.

The surface soil of the Lauderdale stony clay is a dark-gray to grayish-yellow heavy loam, with an average depth of 4 inches. The dark color is due to the accumulation of vegetable matter and burnings of the forest. From 10 to about 50 per cent of the soil mass is made up of cherty or siliceous fragments varying in size from small particles to large stones. The division between soil and subsoil is not very sharp, but at depths between 4 and 20 inches the subsoil is a dull ashy gray to pale grayish red clay, which is crumbly and granular when dry, plastic and sticky when wet, and contains an abundance of rock fragments. Below this depth the subsoil grades into a mass of broken, partly weathered rock whose interstices are filled with a whitish or yellowish clayey material. The roots of trees and herbaceous plants seldom penetrate more than 2 feet below the surface.

The soil is extremely variable in texture, color, and structure, largely because of erosion. Most of the type has been so eroded that the surface soil has been removed, and the reddish, grayish, or whitish clay is exposed. In sections 24 and 25, T. 9 N., R. 3 W., 3 miles west of Bladon Springs, the surface resembles that of the Susquehanna clay, especially in the wooded areas, but the subsoil is typical Lauderdale material. On the Talawampa Creek watershed, between Red Spring School, Ararat, and Womack Hill, the type as mapped includes much rough land of the Susquehanna clay and fine sandy loam and Guin soils—all nonagricultural lands whose exact separation is not important, especially in the rough regions. Iron-cemented sandstone is not uncommon, and accumulations of pure white sand are found in some ravines.

The Lauderdale stony clay extends in an irregular belt, 10 to 15 miles wide, from Cyril and Hinton southeastward across the county

to Cullomburg, Bladon Springs, and the Washington County line. It occupies about 9 per cent of the county's area. A large typical body lies north of Bladon Springs.

The many different strata of the parent rock, which vary in hardness, have through unequal weathering produced a surface comparable to mountains in miniature, such as Lingo and Mill Mountains southwest of Butler, and a local name for the type in its roughest development is "the mountains." Where erosion has been more even over considerable areas, the dissection is complete, as is the case near Bladon Springs. In the region south and west of Riderwood the type caps the long, narrow, winding crests of ridges and extends down the valley sides for a vertical distance of 80 feet or more, where the Guin soils may appear. A well-known example of this is Sickle Ridge, 4 miles south of Riderwood, in sections 29 and 30, T. 13 N., R. 3 W. In other places the type occurs on the steep sides of ridges and hills capped with soils of the Orangeburg or Ruston series, as in sections 5 and 6, T. 13 N., R. 4 W., on Hog Wallow Ridge. Several strips on the lower levels along the larger creeks in the southeastern part of the county are derived from a softer formation which closely resembles the Buhrstone.

Cut-over areas that have been burned over support a stunted growth of black gum and sweetgum, shortleaf and loblolly pine, dogwood, post oak, black oak, red oak, and blackjack oak. A few virgin areas are covered with a pure stand of longleaf pine. This valuable tree does not form a deep tap root on this type as it does on other types of the county; it grows very slowly, has a bushy top, attains only a moderate size, and is said to produce only a small yield of turpentine.

The type is too rough and stony to be cultivated. Experience has shown it to be a sterile, droughty soil. There is a scattered growth of partridge pea. The native grasses and weeds wither and dry by midsummer. The type has been utilized to some extent as goat pasture, but is not esteemed for other stock. It is valued chiefly for its timber, and the greater part has been cut over. Considerable land has been sold for taxes. This soil is adapted only to forestry, and plans for economical handling of it should be worked out by an experienced forester.

### GUIN SOILS (UNDIFFERENTIATED).

The Guin soils (undifferentiated) include materials ranging from loose sands to heavy clays, and occupying rough, broken, hilly, and semimountainous lands. The land consists of small patches of nearly every upland type in the area, so intimately mixed and so eroded that separation into types on a map of the scale used was impossible and would be of no value if it could be made.

The character of the surface soil depends largely upon the material from which it is derived. Such widely divergent soils as the Sumter clay, Norfolk fine sand, and Lauderdale stony clay, may all occur in a nonagricultural condition within the space of an acre. Generally speaking, the soil is broken by eroded spots of diverse texture, no texture being constant for more than a few feet. In places a sandy soil may have a depth of 3 feet or more; in other places erosion has removed the surface soil and exposed the subsoil.

Chiplike shaly fragments, cemented ferruginous sandstone, and bowlders of moderate size, all of a reddish-brown color, are rather common. Large and small fragments of petrified wood appear north of Butler. In regions of the Lauderdale stony clay, fragments of white buhrstone and hard quartzite are very common, and limestone occurs in the vicinity of Melvin.

There are a few elongated patches in narrow valleys or capping winding ridges which might be tilled. Such strips seldom comprise more than 5 per cent of the type or 30 acres to the section. In sections 23 to 36, T. 9 N., R. 4 W., the land includes some Sumter clay. On the watersheds of Tuckabum and Kinterbish Creeks the bulk of the material is of the Orangeburg and Ruston series. The strip lying south of Turkey Creek is similar to the hilly phase of the Susquehanna clay.

The Guin soils (undifferentiated) occur to some extent in nearly every township in Choctaw County. The greater part is located in the two western tiers of townships from Cyril and Riderwood southward to the Washington County line, and southeastward from these places to the Tombigbee River. Large areas lie south of Bogueloosa and on the watersheds of the larger creeks.

The tree growth is as diverse as are the topography, texture, and drainage. On the broad valley sides, sloping 200 to 300 feet to the mile toward the streams, the lower elevations support a growth of swamp pine, loblolly pine, willow, ironwood, beech, sycamore, several species of water-loving oaks, several species of bay, and magnolia, sweetgum, tupelo gum, swamp (red) maple, and holly. Higher lying areas with fairly good drainage are covered with both longleaf and shortleaf pine, basswood, two species of black gum, magnolia, and dogwood. The drier, sandier ridges and knolls on which pure stands of longleaf pine once stood now carry various oaks.

No areas of any importance have ever been tilled and no houses are located on this land. The type is considered nonagricultural land and its value is based solely on the character of the forest growth, cut-over areas having little or no value. The lower, well-watered areas support a growth of lespedeza, carpet grass, and broom sedge. Scant grazing for cattle and goats can be had in the valleys and on the lower slopes. All the land should be kept in forest.

### CAHABA FINE SANDY LOAM.

The surface soil of the Cahaba fine sandy loam consists of about 6 inches of light-brown loamy fine sand underlain by a reddish-yellow fine sandy loam which extends to a depth of 8 to 10 inches. In forested areas and also in some of the better cultivated fields a small quantity of organic matter gives the surface a somewhat darker color. The subsoil to a depth of 36 inches or more is a yellowish-red to reddish-yellow, rather compact, but friable fine sandy clay. In a few places the subsoil is a mottled yellow and red compact clay which shows mottlings of gray in the lower part. In some places the upper subsoil is a reddish-yellow, heavy fine sandy loam, but this quickly passes into the typical fine sandy clay. In a few spots the subsoil clay is red.

This type is developed on the second bottoms or terraces along the larger creeks, such as Okatuppa, Talawampa, Yantley, and Kinter-

bish Creeks, and also along the Tombigbee River. It is the highest lying of the terrace soils. A large area is located in sections 12, 13, and 14, T. 9 N., R. 2 W., on the Tombigbee River.

The Cahaba fine sandy loam has for the most part a level to gently undulating surface, but in places it is gently rolling. All of it has a surface favorable for agriculture. It is naturally well drained.

A considerable part of this soil is cleared and under cultivation; the rest supports a growth of loblolly and old-field pine, with a few oaks, hickory, and other hardwood trees. The soil is easy to cultivate and responds readily to fertilizers and manure. It is naturally one of the strongest of the terrace soils. Practically the same crops are grown upon this type as upon the Kalmia fine sandy loam.

### KALMIA FINE SAND.

The surface soil of the Kalmia fine sand is a grayish-brown to gray, loose and incoherent fine sand 5 to 10 inches deep. The subsoil, to a depth of 36 inches, is a pale-yellow to light brownish yellow fine sand or loamy fine sand. A darker color throughout the soil section appears in spots where seepage waters have favored the growth and gradual decay of water-loving plants.

The Kalmia fine sand, though a terrace soil, resembles the Norfolk fine sand of the uplands in all important characteristics, except origin and topography. The surface is flat to nearly level, with a gradual slope toward the stream. This topography and the presence of a permanent zone of saturation within 5 to 10 feet of the surface render it less susceptible to drought than the Norfolk fine sand.

The type as mapped includes several hundred acres of Cahaba fine sand—a light-brown fine sand underlain by a reddish-yellow fine sand. Separation of this soil was not made, because its difference was not great and its agricultural importance negligible.

Along Talawampa Creek, one-fourth mile north of bridge and 2 miles northeast of Womack Hill, in section 33, T. 11 N., R. 2 W., the subsoil is a very pale yellowish gray, compact fine sand resembling hardpan.

In agricultural value the Kalmia fine sand is somewhat higher than that of the Norfolk fine sand. Yields of corn average from 7 to 10 bushels per acre. Hay yields three-fourths ton per acre. The type warms up early, and crops start well, although late spring frosts occasionally may make necessary a second planting of corn or cotton. A part of the type is flooded by the highest overflows. The forest growth includes shortleaf and loblolly pine, black oak, post oak, water oak, dogwood, hickory, and some longleaf pine and turkey oak on drier parts.

This soil is suited to light farming and to the production of watermelons, peanuts, and rye. It has a low agricultural value for general farming.

### KALMIA FINE SANDY LOAM.

The surface soil of the Kalmia fine sandy loam in forested areas consists of a layer of 1 or 2 inches of dark-gray loamy fine sand, underlain by a pale-yellow fine loamy sand which extends to the depth of 12 to 15 inches. In cultivated fields the soil is a light-gray fine sand to a depth of about 6 inches. The subsoil is a pale-yellow, friable, fine sandy clay.

In the flatter and more poorly drained areas the subsoil is yellow, slightly mottled with light gray. In the better drained areas, particularly about 2 miles south of Pennington, red mottlings occur in the lower part of the 3-foot section. On the river terraces in the extreme northeast part of the county both the soil and subsoil are heavier in texture, and the subsoil is mottled with gray or red below 30 inches. Where this type occurs in close association with the Lauderdale stony clay the soil is lighter colored and the subsoil resembles that of the Myatt fine sandy loam, but even these areas are well drained.

This type has a general distribution along all the large creeks and the Tombigbee River. Typical areas occur south of Barrytown and south of Needham post office and part of the town of Lisman is located on a rather fine textured variation of the type. There also are scattered areas along Puss Cuss and Nigger Creeks.

The surface of the Kalmia fine sandy loam varies from flat and level to gently undulating. The type is fairly well drained, except that seepage water from the uplands affects the drainage of some of the flatter areas.

The Kalmia fine sandy loam is the most extensive terrace soil in the county. Perhaps 25 to 30 per cent of it is under cultivation; the rest is occupied either by virgin or second-growth forest. On the better drained areas, longleaf pine and loblolly pine, with smaller admixtures of oaks, persimmon, hickory, sweetgum, dogwood, and magnolia, constitute the principal trees. The flatter and wetter areas support swamp pine, gum, oaks, and a little cypress.

Until the advent of the boll weevil, cotton was the principal crop grown on this type. At present corn is the main crop, with yields ranging from 10 to 25 bushels per acre. Upland rice has been grown in a small way for many years. The more nearly level areas are used for sugar cane, which produces a high-grade, bright-colored, and fine-flavored sirup. Sweet potatoes yield from 100 to 200 bushels per acre. Peanuts yield well, and sorgo, Johnson grass, velvet beans, and cowpeas give fair returns.

The Kalmia fine sandy loam is held at $8 to $20 an acre, depending upon improvements and location.

For the improvement of the Kalmia fine sandy loam it is essential that the flatter areas be drained. The soil will be greatly improved by the incorporation of large quantities of organic matter, which can be supplied by turning under such crops as cowpeas and velvet beans. The application of from 1 ton to 1½ tons of lime will be beneficial, particularly where peanuts are to be planted. The soil is easy to till, but does not warm up as early in the spring as the Norfolk fine sandy loam of the uplands. It responds generously to the application of commercial fertilizers.

### LEAF FINE SANDY LOAM.

The surface soil of the Leaf fine sandy loam is a light-gray to dull-gray loamy fine sand passing at about 3 to 5 inches into a pale-yellow loamy fine sand, which extends to a depth of 8 to 10 inches. The subsoil is a mottled red, gray, and yellow plastic clay. Below 18 or 20 inches the gray color predominates and is mottled with red and yellow, and in a few places the red mottlings are absent.

In some of the poorly drained areas the surface soil is dark gray, and has a noticeable content of organic matter. On some of the knolls and ridges the subsoil is redder and resembles the Cahaba. Northwest and north of Lisman, on Tuckabum and Yantley Creeks, the type ranges from a fine sandy loam to a very fine sandy loam and includes a few spots of Myatt silty clay loam. In this region of fine material, a light-yellowish to whitish, compact layer, extending from 10 to 18 inches, is developed. This compact, impervious layer is dry even in the wettest seasons. Below this the subsoil is a yellow-gray plastic clay.

With the exception of a few areas on the terraces along the Tombigbee River, this type is developed entirely on the terraces of the larger creeks. More important areas lie along Turkey and Puss Cuss Creeks and representative areas appear at Bolinger and southeast of Silas.

The surface of this type is comparatively smooth and flat, though there is a gradual slope toward the streams and with the direction of their flow. Many small branches drain from the uplands directly across these areas into the main creeks. Taking the type as a whole, the natural surface drainage is poor; about one-fourth of the type has fairly good drainage. The lower lying parts are overflowed during high stages of the streams, but only for a short time. One cause of the poor drainage is the heavy clay subsoil, which hinders the passage of water either downward or laterally.

The Leaf fine sandy loam has always been considered a fairly good soil. About one-half of the type is either under cultivation or is used for pasture. The forest growth consists principally of loblolly and longleaf pines, with an admixture of hardwoods, including oaks, hickory, cottonwood, and willow. The second growth consists mainly of loblolly and old-field pine, scrub oaks, and sweetgum.

Corn, the principal crop, gives light yields, except where heavily manured or fertilized. Sugar cane does well on the better drained areas. Oats and velvet beans are grown with a fair degree of success. When cleared and grazed the land makes good pasture, and the raising of beef cattle is a relatively important industry. The treatment outlined for the improvement of Kalmia fine sandy loam will apply equally well to this type.

### LEAF CLAY.

The surface soil of the Leaf clay is a dull-gray, slightly mottled with rusty-brown, sticky, plastic clay, of an average depth of about 6 inches. The subsoil, to a depth of 36 inches, is a grayish-yellow, mottled with dull-red and gray, plastic, sticky clay, the gray color becoming more prominent in the lower subsoil. In a few places the entire subsoil is a mottled gray and yellow or light-gray clay.

This type occurs in small areas near Quinns Landing on the river, and about 5 miles northeast of Lisman, on Tuckabum Creek. It occupies level areas that have poor surface drainage. During rainy seasons water stands on the surface, and when this evaporates the surface soil bakes and cracks.

A small part of this type is cultivated to corn, and some of it is used as pasture land. Forested areas support a growth of willow, cottonwood, ash, hickory, and water oak. The soil needs to be

drained and limed. In its present condition it is best suited for pasture and forestry.

### MYATT FINE SANDY LOAM.

The surface soil of the Myatt fine sandy loam is a dull-gray or ashy-gray loamy fine sand to light fine sandy loam, with an average depth of 6 inches. The subsoil is a dull bluish gray fine sandy clay, mottled with yellow or brown, and in places below 30 inches with dull yellowish red. Locally a thin surface layer is dark gray to black owing to very recent accumulations of partly decomposed vegetable matter, and mottlings of brown appear below the immediate surface. In a few recently tilled areas the soil has a lifeless, bleached, ashy-gray appearance. The soil is usually somewhat sticky and compact when wet and rather loose and floury when dry.

The type as mapped includes several variations. North of Isney, in sections 26 and 35, T. 10 N., R. 5 W., near the State line, there are small areas of Myatt fine sand. Along Talawampa Creek, 1½ miles northeast of Womack Hill, there is considerable silt throughout the soil section, and the subsoil in places is a tough bluish-gray plastic clay. As a rule the type is siltier and heavier in the two northern tiers of townships than elsewhere. On Boguelichitto and Tuckabum Creeks, southwest and northwest of Lisman, the texture varies widely. Near Mose Spur the type resembles the Leaf fine sandy loam. In many places along the larger creeks the boundary line between this type and the Kalmia and Leaf soils was drawn with difficulty. Numerous strips of the Myatt fine sandy loam lying between the Kalmia, Cahaba, or Leaf types and the upland were included with the dominant type.

The Myatt fine sandy loam occupies scattered areas on the lower and flatter parts of the terraces along the creeks and the Tombigbee River.

The surface is almost level, with numerous depressions. The drainage is poor; much of the surface is under water during the wetter part of the winter, but in summer the type dries and bakes. These extremes of wetness and dryness tend to destroy the organic constituents of the soil and have marked influence on the structure and appearance of the soil.

Very little of the Myatt fine sandy loam has ever been used for farming. The type is forested with various oaks, bay, magnolia, cypress, sweetgum, swamp pine, black and tupelo gum, holly, titi, ash, and loblolly pine. The pasturage is good in the cleared areas. Lespedeza, broom sedge, and carpet grass are among the more valuable pasture plants.

In its present condition the type has a low agricultural value. It is known locally as "swamp land" or "hammock land." It is believed most of it could be reclaimed by a comprehensive system of drainage works. Until this shall be done, it will be inadvisable to attempt to farm the areas of this soil.

### OCHLOCKONEE FINE SANDY LOAM.

The surface soil of the Ochlockonee fine sandy loam is a brown to dark-brown fine sand to loamy fine sand, 5 to 12 inches deep. Under continued tillage it assumes a bleached light-brown to gray color, suggestive of a lack of organic matter. In places the lower part of

this upper layer is more or less mottled with yellow, yellowish brown, rusty brown, or gray. The subsoil is a fine sandy clay, clay loam, or fine sandy loam, much more variable than the soil, and in many places is made up of successive deposits of different textures, ranging from sand to clay and varying in content of organic matter. Soft black and brown, small iron-oxide accretions are common in the mottled parts.

Included with the type are small areas of Thompson fine sandy loam, having a yellow subsoil. These spots are most numerous along Ulmer Creek, 3 miles west of Butler. Spots of Ochlockonee sand are also included because of their small size. One of these is situated a mile southwest of Okatuppa in the northeast quarter of section 8, T. 11 N., R. 4 W.

On Okatuppa Creek the type has numerous variations, consisting of spots of black limy clay, colluvial soil of various kinds, and areas of Bibb fine sandy loam. Below the mouth of Puss Cuss Creek the bottom soils are prevailingly darker, owing to the admixture of material from the limy soils. In places on the banks of the river there are narrow strips of loamy fine sand, as at Lenora Landing and between Turkey and Okatuppa Creeks. This is overflowed only by exceptionally high floods. On many of the streams north of Lisman the soil has enough very fine sand and silt to give it a floury, powdery feel when dry. In an area one-half mile south of Lisman, the heavy subsoil forms a semihardpan which is brittle and dry even in the wettest weather.

The Ochlockonee fine sandy loam is mapped in every township in the county. It occurs in the first bottoms of all the larger creeks, and covers a small acreage along the Tombigbee River. Although all the type is subject to overflow, such creeks as Okatuppa, Turkey, and Talawampa are seldom out of their banks more than one day, and unless continuous rains prevail the land is never under water more than 2 or 3 days, except from back water. A moderate rise of the river covers the low areas of the Ochlockonee fine sandy loam for a week or 10 days, a high flood lasts 2 to 4 weeks, and there have been a few floods of much longer duration. Most of the type is sufficiently well drained to be used for agriculture, and crops are seldom entirely destroyed, although damaged occasionally.

The Ochlockonee fine sandy loam is an extensive and important type. From 40 to 50 per cent of its area has been cleared, but only a small part is cropped annually. A considerable acreage on the larger creeks close to the river and on the river bottoms has been allowed to revert to pasture, as a result of several recent high floods. This pasture is being encroached upon by a scattered growth of loblolly pine, sweetgum and sassafras. On uncleared areas the principal trees are swamp pine, beech, gum, water oak, willow oak, loblolly pine, magnolia, bay, hickory, sycamore, cottonwood, birch, and elm, with some tupelo gum and cypress on wetter areas. Shrubs and smaller trees, such as ironwood, holly, willow, alder, titi, and prickly ash, are common.

The Ochlockonee fine sandy loam is a very productive soil. Under favorable conditions, that is, when not overflowed or kept permanently soggy by continued rains, it produces 10 to 50 bushels of corn, with an average of 20 bushels. A few farmers still attempt to grow

cotton on the higher sandier spots, but the crop is always precarious and in a wet season a total failure. Sugar cane yields as much as upon any other type in the area. Sorgo also does well. The wide bottoms afford good opportunities for the production of hay. Water grass (*Paspalum* var.) mixed with Johnson grass, lespedeza, Bermuda grass, and broom sedge, yield from 1 ton to 1½ tons per acre. Hay land is usually plowed in the spring to insure a midsummer volunteer crop. Oats, where not subjected to overflow of more than 48 hours in winter or one day in spring, do quite well. No yields are reported, as the crop is fed in the sheaf. Cowpeas do well, yields of 10 bushels per acre being reported. Velvet beans, grown in corn, make a valuable crop for this bottom-land soil.

Many fields could be protected from overflow by straightening stream courses, deepening channels, and constructing levees and ditches. The remains of such improvements made before the Civil War may be seen here and there. Care must be taken that ditches do not become filled with sand, and some parts of the type can not be safely ditched under present conditions of erosion of the uplands. Carefully laid out furrows will assist drainage and prevent damage to winter crops of oats.

### OCHLOCKONEE CLAY.

The surface soil of the Ochlockonee clay is a grayish-brown to dark-brown clay or clay loam, 6 to 8 inches deep. When wet the soil is plastic and sticky and when dry it cracks and is compact and hard, but in most cases it contains enough organic matter to give it a crumbly structure, The subsoil is a brown, heavy, tough clay, which is slightly mottled with yellow or gray. In a few places the subsoil is a mottled rusty-brown, gray, and yellow, plastic clay, and in other places it has a steel-gray color in the lower part of the 3-foot section. Locally the subsoil is a bluish, steel gray, or mottled gray and yellow, plastic clay. The mottlings in the subsoil are more noticeable in the poorly drained areas, and red mottlings are seen in a few places.

The Ochlockonee clay is developed on the flood plain of the Tombigbee River, where it occupies an almost unbroken area throughout the entire length of the county. It also extends up the larger tributary streams as far as ordinary back water deposits reach.

The surface in general is flat, although in places there are local differences of elevation of several feet. There are numerous sloughs which lose water mainly by evaporation and seldom become entirely dry. The subsoil drainage is very slow. The Ochlockonee clay is an extensive type, but only a very small proportion of it is under cultivation and a small part formerly tilled is in pasture. By far the greater part is in mixed forest of water-loving hardwoods. Some fine merchantable timber still remains.

The pasture and hay plants include nut grass, Johnson grass, broom sedge, and water grass. Bermuda grass makes a scattering growth in fields long cleared and in pastures; it is believed to have been distributed largely by overflows. Carpet grass and crab grass grow luxuriantly in old fields. Oak mast is abundant on this, as on all other river-bottom soils, and provides considerable fall forage for hogs. The type formerly supplied pasturage for hogs and cattle throughout

the winter, but since the destruction of switch cane in the flood of 1916, stock must be fed to carry them through the cold weather.

Aside from hay, corn is practically the only crop grown. The yields vary widely, ranging as high as 40 to 60 bushels per acre on the best fields under favorable conditions; in some years rains or floods may cause a total loss. Farmers do not expect more than an average of three fair to good crops in five years, and the average yield for a series of years does not exceed 20 bushels per acre. Corn often produces a good crop even when planted late in June. In case of a total loss of the corn crop, cowpeas for hay have been grown on a few farms with marked success even when sown in July. June or July floods are unusual, but where the corn is killed a fair crop of coarse, weedy hay is sometimes obtained. Corn is planted on beds and given the usual tillage. No fertilizer is used, and apparently none is needed for good crop production. Sorgo yields 125 to 200 gallons per acre, and sugar cane yields 125 to 500 gallons of sirup, with an average of about 200 gallons. Forage sorgo produces 2 tons per acre, cowpeas 1½ to 2 tons. Land of this type is valued at $5 to $15 an acre.

The greatest need of the Ochlockonee clay is drainage and protection from overflow. At present overflows can not be prevented, but the drainage conditions can be improved. The pasture and hay land can be greatly improved by seeding with lespedeza or Johnson grass. Owing to the compact nature of the soil and the prevalence of weeds, fall plowing of the higher parts would be beneficial.

### CHASTAIN CLAY.

The surface soil of the Chastain clay in Choctaw County consists of about 6 inches of very dark gray to dark-brown clay, which is compact when dry and plastic and sticky when wet. In fields overgrown by grass the surface soil may contain streaks of a rusty brown. Under cultivation the soil has no mottlings and in places is slightly lighter in color. In the lower lying and wetter areas the soil may vary with extremes of wetness and dryness from almost black to light gray. The subsoil is a grayish-brown, mottled dull-red and rusty-brown, heavy silty clay, brittle when dry and very plastic and sticky when wet. At about 20 to 24 inches the subsoil is usually mottled yellow and brown, rusty brown, and steel gray. The gray color predominates in the lower subsoil to a depth of about 36 inches, where a bluish steel gray prevails. The line of demarcation between soil and subsoil is not always definite, and varies greatly with drainage conditions of the upland.

In many places it is impossible to determine accurately the boundary line between the Chastain clay and Ochlockonee clay, because the land is in almost impenetrable forest. The Chastain clay differs from the Ochlockonee in being heavier and more plastic and in having a reddish or more mottled coloration in the subsoil.

The type is developed in the first bottoms along the Tombigbee River. It does not border directly on the river but occupies positions back toward the terrace and usually lower than the river bank. It is known locally as "back land." A rise of the river to flood stage of 39 feet at Demopolis is sufficient to flood nearly all the type.

The surface is generally flat and slopes a few inches per mile in the general direction of the river current. Local differences in elevation

of from 10 to 15 feet are not uncommon. These strip-like areas lying next to the upland or to the terrace usually contain numerous sloughs in which backwater may remain until evaporated. The surface drainage of at least 80 per cent of the type is such that water is removed readily when the river subsides. The subsoil drainage is very poor.

A few low ridges and high-lying fields have been kept in cultivation, but the area cultivated has decreased greatly during the last decade, owing largely to the frequency of unseasonable overflows. Recently abandoned fields are covered with a dense growth of lespedeza, carpet grass, some paspalum, and broom sedge, which afford good grazing. Occasional patches of Bermuda grass add to the value of the pasture. About one-fourth of the type is forested with some of the most valuable hardwood stands remaining in the county.

Wild hay yields three-fourths to 1 ton, and corn 20 to 50 bushels per acre. Sometimes the corn crop is destroyed by overflows. Corn may be replanted three times and still make a full crop. Unless the first planting is covered by water for several weeks, the ground is not replowed, the later plantings being by hand. A common practice is to plant while the soil is still water-soaked, without further tillage. A hole is made with a stick, the corn dropped, and pressed with the foot; such corn is known as stuck corn. Sometimes a hoe is used in replanting.

Prevention of overflow during the growing season is not practicable at present. The type is adapted to the production of wild hay and corn. Sorgo and velvet beans make good forage crops. The best yield of hay is produced where the land is plowed annually. The pastures on this soil support many hogs and cattle. The type is given over to free range in winter, the crop of oak mast and other forest feeds being valuable. Pasturage and forestry are perhaps the best uses for this soil in its present condition.

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

*Mechanical analyses of Chastain 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.* | *Per cent.* |
| 416524 | Soil, 0 to 8 inches | 3.6 | 1.7 | 1.6 | 16.2 | 5.6 | 33.6 | 37.7 |
| 416525 | Subsoil, 8 to 36 inches | 3.1 | 2.5 | 1.1 | 10.2 | 5.4 | 31.8 | 45.7 |

### CATALPA CLAY.

The surface soil of the Catalpa clay is a dark grayish brown or rusty-colored, heavy plastic clay 6 to 10 inches deep. The subsoil is a drab, heavy, plastic clay to the depth of 3 feet or more. In the more poorly drained spots the subsoil is bluish gray or light gray slightly mottled with yellow or rusty brown. Bordering some of the areas of Sumter clay the surface may be light gray or whitish from the fresh deposition of material from rotten limestone; in other places noticeable quantities of fine sand have been washed in from the sandy upland soils. In some spots once poorly drained the clay is black.

The soil dries and cracks and is very hard. If plowed when wet it breaks into big clods which remain hard during the cropping season. On the other hand, when there is plenty of organic matter in the soil and when it is plowed under proper moisture conditions it has a somewhat crumbly and granular structure.

The Catalpa clay is confined to small strips along Puss Cuss Creek and its principal tributaries, Lee, Gin, Nigger, and James Creeks. It represents material washed principally from areas of the Sumter clay, together with an admixture of material from the other soils. The surface of this type is usually flat with a gentle slope toward the stream or in the direction of the flow. Although the type is subject to overflow, most of it is well drained, and crops are seldom entirely destroyed by flood waters.

Perhaps 90 per cent of this soil is under cultivation; the remainder supports a growth of hackberry, sycamore, ironwood, oaks, elm, and gum, with some leatherwood. It is considered one of the strongest soils in the county. Corn, practically the only crop grown, yields from 20 to 60 bushels per acre. Johnson grass does exceptionally well on this soil, and the yields of hay are large. Johnson, carpet, and crowfoot grasses and lespedeza thrive, making excellent pasturage. Fertilizer is not necessary on this soil. This is the only first-bottom soil in the county which has a sufficient supply of lime. When properly cultivated there is every reason to expect large yields of corn and hay. Land of this type is usually valued at $25 to $30 an acre.

### MEADOW.

The soil material of the areas mapped as Meadow is so variable in texture, color, and structure that it could not be separated into soil types. Meadow includes narrow strips of alluvial and colluvial material along the smaller, and for the most part intermittent, creeks and branches, which are subject to overflow several times annually and whose material is likewise subject to annual modification through erosion and deposition. Sands, fine sands, and fine sandy loams are mingled with patches of soil of heavier texture; and all vary widely in drainage conditions and in content of organic matter. The subsoil is likewise variable in texture and includes materials ranging from loose incoherent sand to clay.

The soil averages dark gray to brown in color. The subsoil has many colors, predominantly yellow, gray, blue, and rusty brown, mixed in many varying proportions, shades, and combinations. If the included materials could be mapped separately, they would be divided between the Bibb, Ochlockonee, Catalpa, and Thompson series.

In the regions of Sumter clay and elsewhere where the streams cut through limy formation the Meadow has a darker color, heavier texture, and higher lime content, and is a better soil. Where patches of Meadow are bordered by very steep hills of cleared land, the erosion caused by deluging rains may cover the surface several feet deep with sterile, droughty sand. Along branches traversing the Lauderdale stony clay the Meadow is generally inferior. The streams may have a gradient of 100 feet or more in a mile and cause very frequent washings.

The soil material here is usually rather stony and consists largely of unweathered Tallahatta buhrstone, and is seldom tilled. Along many incipient drainage ways too small to be shown on the map there are areas of Meadow.

In its natural condition all the Meadow is permanently wet, and some of it is under water most of the time. All is subject to frequent overflow. Areas of Meadow along the lower courses of small streams flowing directly into the river or large tributary creeks may be covered with backwater for a few days or several weeks during the flood stage of the river.

About 15 per cent of the Meadow is tilled annually. The uncleared land supports a varied growth of water-loving trees, and a junglelike undergrowth of bamboo and grape and other vines.

The pasturage is excellent for at least eight months in the year. The pasture plants include switch cane, hardy sedges, and native grasses, among which carpet grass is very good. Lespedeza flourishes, especially where the land has better drainage, and may produce 800 to 1,200 pounds of hay per acre. Water grass (*Paspalum* var.) gives fair yields of hay, but its chief value is for grazing. Johnson grass has a moderate distribution and produces good yields of hay. Crab and crowfoot grasses grow in tilled fields. Sedges and rushes furnish more or less pasturage in the wintertime.

A few farms in the county have several acres of Meadow under annual tillage. The principal crops are corn, sugar cane, sorgo, hay, and velvet beans. Corn yields are fairly dependable and average 20 bushels per acre; sugar cane yields 100 to 400 gallons of sirup with an average of 150; sorgo, 75 to 200 gallons, with an average of 125; hay, three-fourths to 1½ tons; velvet beans from one-half to three-fourths ton per acre.

Much of the Meadow can be reclaimed by deepening and straightening stream channels and by digging lateral ditches to the foot of adjacent slopes. Ditches dug so as to intercept seepage water from the foothills are necessary in places.

Although Meadow is never sold separately, it is usually considered more valuable than the surrounding upland types.

## SUMMARY.

Choctaw County presents a wide diversity in topographic features, soil characteristics, and drainage conditions. The climate is favorable for a long growing and grazing season, and a large number of crops can be produced.

At present about one-fifth of the county is under cultivation, and about one-third to two-fifths is suited to cultivation. About two-thirds to three-fourths is adapted only to pasturage or forestry, and probably half of the county should remain in forest or be allowed to revert to forest.

The smoother parts of the Orangeburg, Ruston, Norfolk, Luverne, Sumter and Susquehanna soils of the uplands, and the Cahaba, Kalmia, Catalpa, a part of the Ochlockonee of the second and first bottoms are adapted to general and special farming. Upon these

soils can be grown any crops suited to the climate of southwest Alabama. The Leaf soils, the Susquehanna clay, parts of the Sumter, Chastain, Ochlockonee, and Catalpa soils are suited to grasses for pasturage. The Lauderdale stony clay, Susquehanna clay, in part, the hilly phase of the Susquehanna clay, and the Guin soils are better adapted to forestry than to agriculture. The principal merchantable timber includes longleaf, shortleaf, and loblolly pine of the uplands, and hardwood in the bottoms.

The population of the county is very scattering, except in a few localities. Lands are very cheap, and exceptional opportunities exist for farmers of small means.

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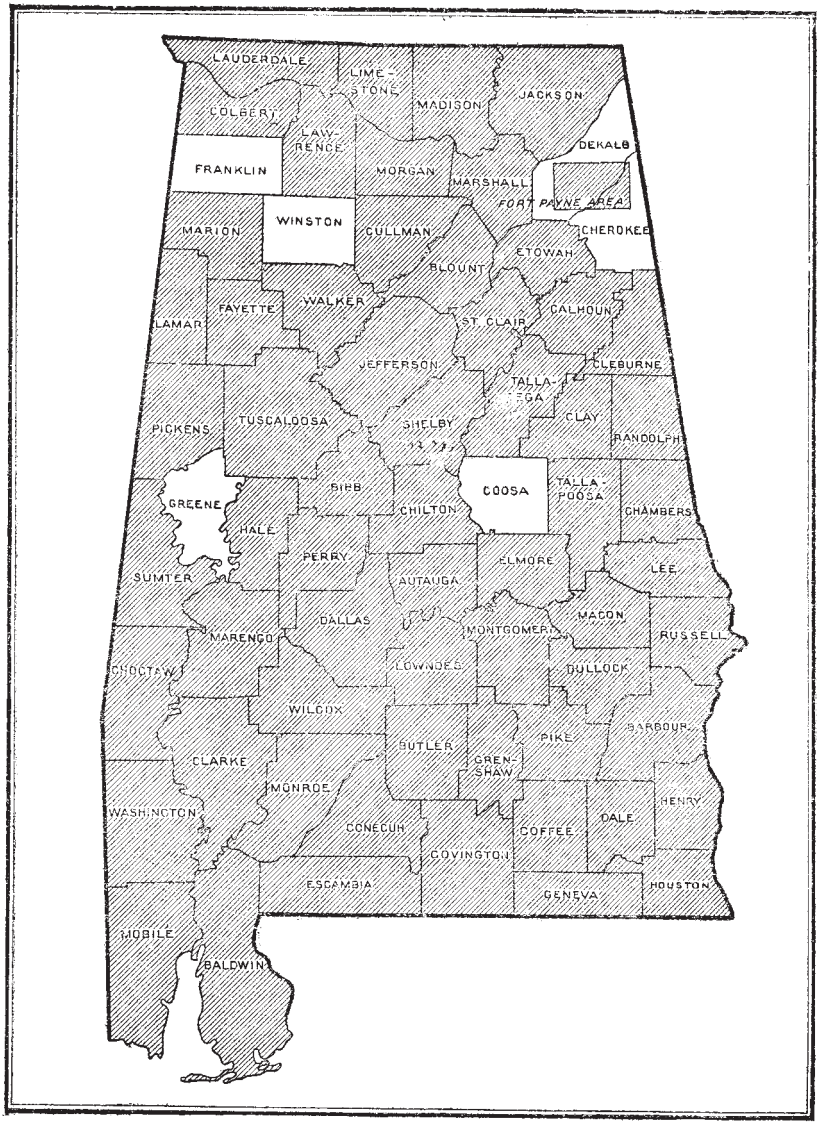


Areas surveyed in Alabama, shown by shading.

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