

U. S. DEPARTMENT OF AGRICULTURE,

BUREAU OF SOILS—MILTON WHITNEY, Chief.

IN COOPERATION WITH THE STATE OF MISSISSIPPI, THEODORE G. BILBO,
GOVERNOR; E. N. LOWE, DIRECTOR, STATE GEOLOGICAL SURVEY.

SOIL SURVEY OF PIKE COUNTY,
MISSISSIPPI.

BY

A. T. SWEET, IN CHARGE, E. W. KNOBEL, H. G. LEWIS, AND
W. I. WATKINS.

HUGH H. BENNETT, INSPECTOR, SOUTHERN DIVISION.

[Advance Sheets—Field Operations of the Bureau of Soils, 1918.]



WASHINGTON:
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MISSISSIPPI

SOIL SURVEY OF PIKE COUNTY

LETTER OF TRANSMITTAL.

U. S. DEPARTMENT OF AGRICULTURE,
BUREAU OF SOILS,
Washington, D. C., May 13, 1920.

SIR: In the extension of the soil survey in the State of Mississippi work was undertaken in Pike County during the field season of 1918. This work was done in cooperation with the State of Mississippi, Theodore G. Bilbo, Governor; E. N. Lowe, Director State Geological Survey.

I have the honor to transmit herewith the manuscript report and map covering this area, and to recommend their publication as advance sheets of Field Operations of the Bureau of Soils for 1918, as provided by law.

Respectfully,

MILTON WHITNEY,
Chief of Bureau.

Hon. E. T. MEREDITH,
Secretary of Agriculture.

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MAP.

Soil map, Pike County sheet, Mississippi.

SOIL SURVEY OF PIKE COUNTY, MISSISSIPPI.

By A. T. SWEET, In Charge, E. W. KNOBEL, H. G. LEWIS, and W. I. WATKINS.—Area Inspected by HUGH H. BENNETT.

DESCRIPTION OF THE AREA.

Pike County is situated in the southwestern part of Mississippi, bordering the Louisiana State line. The center of the county is approximately 90 miles north of New Orleans and 85 miles south of Jackson. The county, which is rectangular in shape, has a length from north to south of 24 miles and a breadth from east to west of 17 miles. Its area is 407 square miles, or 260,480 acres.

The county as a whole is a plain lying 400 to 500 feet above sea level and sloping gently toward the south. Through this there have been cut several rather broad, shallow valleys and numerous smaller drainage ways. The general slope of this plain is shown by the elevation of stations along the Illinois Central Railway. Summit, in the northern part of the county, has an elevation of 430 feet; Fernwood, 7 miles south of this point, an elevation of 334 feet; Magnolia, near the central part of the county, an elevation of 415 feet; and Osyka, in the extreme southern part, an elevation of 251 feet. These stations, however, indicate a slightly greater slope than that of the higher parts of the upland, as the last three named points occupy positions on the slopes adjacent to stream valleys or on high terraces.

In detail the topography consists of nearly level or flat areas which extend as long, narrow belts to form the divides between the drainage systems. The flat, poorly drained character of these divides is well shown in Plate I, figure 1. On each side of these divides the topography is gently undulating to rolling, and the surface becomes gradually more broken as the large stream valleys are approached. Such belts border the valley of Tangipahoa River from its junction with the Little Tangipahoa to the south line of the county. Similar areas occur along the Bogue Chitto River and Topisaw and East Topisaw Creeks. Some of the steeper slopes bordering the large valleys rise 50 to 150 feet above the valley floor.

The most important level upland areas form the divide in the south-central part of the county between Tangipahoa River on the



FIG. 1.—Sketch map showing location of the Pike County area, Mississippi.

west and Bala Chitto Creek on the east. In the northwestern part of the county a like area forms the divide between Tangipahoa River on the west and Bogue Chitto River on the east.

The larger streams occupy broad, almost level valleys, the floors of which lie only a few feet above the mean water level of the streams. The streams follow extremely tortuous courses and in many places divide into several channels. The lower or first bottoms of the principal streams vary in width from less than one-fourth mile to three-fourths of a mile, the average width being about one-half mile. The smaller streams of the county have valleys varying in width from only a few rods to one-fourth of a mile. Bordering the first bottoms of the larger streams there are in many places low, broad terraces or second bottoms (sometimes called benches). Many of these lie only a few feet above the first bottoms, and are subject to overflow at times of exceptionally high water. Others lie at higher elevations, being separated from the first bottoms by a well-defined bluff 10 to 40 feet in height. The outer edge of these higher terraces often grades almost imperceptibly into the adjacent uplands, so that it is difficult to tell where the terrace ends and the uplands begin. In some places the second bottom of a large stream lies at about the same elevation as the first bottom of a tributary stream which enters the main valley across the terrace.

The largest stream in this county is Bogue Chitto River, which flows southeastward through the northeastern part of the county. Topisaw Creek, its largest tributary, drains the extreme northeastern part of the county. Other tributaries, chiefly Beaver Creek, Clabber Creek, and Clear Creek, drain the north-central part. The Tangipahoa River and its two principal tributaries, Little Tangipahoa and Bala Chitto Creek, drain the central and southern parts of the county.

With the exception of the narrow, nearly flat ridges and parts of the first bottoms and terraces, the entire county is well drained. The excess rainfall flows off either into minutely branching tributaries which reach into all parts of the upland or into depressions or gullies. The larger streams have deep channels and their currents are swift. They can be forded in but few places and then only at low stages of the water. Plate I, figure 2, shows the characteristic swampy vegetation in the first bottoms along Bogue Chitto River.

The territory of which Pike County afterwards became a part was originally occupied by the Chickasaw, Choctaw, and Natchez Indians. According to local history, the first pioneer settled about 7 miles north of the present site of Holmesville in 1799 and a few other settlers arrived at about the same time or soon afterwards. Between 1800 and 1816 settlers came in large numbers from Alabama and Georgia, settling along the Bogue Chitto River, Bala Chitto Creek,

and the other large streams. Pike County was organized in 1815 and the county seat established at Holmesville the next year. It was afterwards changed to Magnolia, the present county seat. In 1914 Pike County was divided into two almost equal parts by a line running north and south 1 mile west of the line separating ranges 9 and 10 east. The area east of this line was organized as Walthall County.

Magnolia had in 1910 a population of 1,823. It has a large cotton mill, an oil mill, and other important industries. McComb, the largest town in the county, had a population of 6,237 in 1910. It is a division point on the Illinois Central Railway and has extensive railway shops, a creamery, and other industries. Summit had a population of 1,471 in 1910. It is the center of a well-developed farming country. Fernwood has large lumber and planing mills and is surrounded by highly developed stock farms. Osyka, in the extreme southern part of the county, is the center of a truck and strawberry growing section. There are numerous other shipping points and trading centers.

The population of Pike County in 1910, including the present county of Walthall, amounted to 37,272, of which 83.3 per cent was classed as rural, comprising all the population outside the town of McComb. The census reports 47.2 per cent of the population as colored.¹

The principal towns of the county have excellent railway service. The Illinois Central traverses the county from north to south and passes through Summit, McComb, Fernwood, Magnolia, Chatawa, and Osyka. This is a double-track railway, furnishing direct service to New Orleans and to Memphis, Chicago, St. Louis, and other points. The Liberty-White Railroad crosses the county from east to west and the Fernwood & Gulf extends from Fernwood to Tylertown in Walthall County. An interurban line which is to extend from McComb to Magnolia is in process of construction.

The main public roads in the western part of the county are good. They have been well graded and surfaced with Coastal Plain gravel and sandy clay. Roads of this kind radiate from Magnolia and from McComb into many parts of the county. Plate II, figure 1, shows one of these roads, between Magnolia and McComb. In the eastern part of the county the roads are not so good, but steps are being taken to improve them. Between the main roads are numerous "settlement" roads. These sometimes follow land lines, but more often meander through the cut-over pine woods. On the level uplands

¹ Since this report was written the preliminary announcement of the population of Pike County and its civil divisions in 1920 has been issued by the Bureau of the Census, as follows: Pike County, 28,725; urban, 7,775; rural, 20,950; McComb, 7,775; Magnolia, 2,012; Summit, 1,187; Osyka, 704; Johnston Station, total, 235, part in Pike County, 24.

or ridges these secondary roads are in many places quite good, but in the more rolling sections and in the stream bottoms they are in many places almost impassable. Rural mail delivery routes and telephone lines reach into nearly all parts of the county.

McComb is the best local market for farm products, although Magnolia and the other larger towns furnish a demand for considerable quantities. All the large towns are shipping points for milk. Large quantities of poultry and poultry products are marketed locally. New Orleans is the principal market for dairy products. Live stock, vegetables, berries, and many other farm products are shipped north to Chicago, Memphis, St. Louis, and other large centers. Much lumber is at present (1918) being shipped to Gulf ports for use in shipbuilding.

CLIMATE.

Pike County has an annual rainfall ranging from 40.83 inches in the driest year on record (1899) to 82.91 inches in the wettest year (1905). The average for a period of many years is 60.6 inches. The heaviest rainfall occurs normally during the summer months, the mean rainfall for July, the wettest month, being 7.35 inches and the total for the three summer months 18.72 inches. October is the driest month, having a mean rainfall of only 2.57 inches, and the fall is the driest season, the mean for the three fall months being 9.88 inches. The mean rainfall for the three spring months is 15.93 inches, and for the winter months 16.07 inches. There is invariably sufficient rainfall, if proper means are taken to conserve the moisture, for any crop grown in the area. Many of the rains, however, are torrential, and do considerable damage by eroding and gulying the soil and overflowing the bottom lands.

The mean annual temperature at Magnolia is 66.5° F. The maximum range is 106°, or from 1° below zero to 105° F. The summer season has a mean temperature of 80.7°, the fall 67.5°, the spring 66.9°, and the winter 50.8°. August is the hottest month, and December the coldest.

Killing frost has been recorded as late in the spring as April 25, and as early in the fall as October 24. The average date of the last killing frost in the spring is March 18, and that of the first in the fall, November 8. This gives a normal growing season of 235 days, which is sufficient for the growing of more than one crop during the season. Much plowing and other farm work may be done during the winter season.

The following table gives the normal monthly, seasonal, and annual temperature and precipitation as recorded by the Weather Bureau station at Magnolia:

Normal monthly, seasonal, and annual temperature and precipitation at Magnolia.

Month.	Temperature.			Precipitation.		
	Mean.	Absolute maximum.	Absolute minimum.	Mean.	Total amount for the driest year (1899).	Total amount for the wettest year (1905).
	<i>° F.</i>	<i>° F.</i>	<i>° F.</i>	<i>Inches.</i>	<i>Inches.</i>	<i>Inches.</i>
December.....	50.4	82	13	5.75	3.94	5.54
January.....	50.9	81	14	4.89	6.73	6.29
February.....	51.1	83	— 1	5.43	2.78	12.82
Winter.....	50.8	83	— 1	16.07	13.45	24.65
March.....	61.3	91	24	5.39	5.04	5.23
April.....	66.0	92	30	5.81	.97	14.59
May.....	73.5	101	39	4.73	.30	6.73
Spring.....	66.9	101	24	15.93	6.31	26.55
June.....	79.9	104	52	5.53	8.80	2.24
July.....	81.0	105	60	7.35	2.35	7.91
August.....	81.2	103	55	5.84	5.21	8.49
Summer.....	80.7	105	52	18.72	16.36	18.64
September.....	77.2	103	40	4.35	1.94	5.83
October.....	67.0	99	28	2.57	.63	3.66
November.....	58.2	88	20	2.96	2.14	3.58
Fall.....	67.5	103	20	9.88	4.71	13.07
Year.....	66.5	105	— 1	60.60	40.83	82.91

AGRICULTURE.

The earlier settlers in Pike County were engaged principally in stock raising. Practically all the county was covered with a heavy growth of virgin forest, largely pine, but there was good pasturage of native grasses and cane in the stream bottoms. Small areas of the red hill lands and parts of the first bottoms and terraces were cleared. Corn, cotton, wheat, tobacco, and sweet potatoes were grown, principally for home use. Some of these older farms have been under cultivation for nearly 100 years. The agricultural development of the county, however, has been very gradual, and in 1917 the State Tax Commission reported 190,401 acres, or over 72 per cent of its area as wild and uncultivated land. The greater part of this is unfenced cut-over land. The merchantable timber has practically all been removed, leaving scattering rejected pine trees, and some bodies of second-growth pine. (Plate I, fig. 1.) Where the forest growth has been removed for a few years a dense growth of post oak and blackjack oak has sprung up. These cut-over lands support during the spring and early summer a luxuriant

growth of native grasses, of which carpet grass is the most important. Lespedeza also grows wild throughout this region, thriving especially in the bottoms and on the terraces. On the dry hill lands its growth is retarded during hot weather. The State Tax Commission in 1917 reported only 1,555,000 feet of merchantable timber in the county.

In 1880, according to the census, 58 per cent of the area of Pike County was in farms, only 21 per cent of whose area, or 12 per cent of that of the entire county, was under cultivation. Ten years later the percentage of the county under cultivation had increased to 18, while in 1900 it amounted to 21 and in 1910 to over 26 per cent.¹ The State Tax Commission reported the area of cultivated land in Pike in 1915 as 62,450 acres, and in 1917 as 64,974 acres. During the progress of the soil survey in 1918 it was reported that more new land had been fenced, cleared, and put under cultivation during the winter of 1917 and the spring of 1918 than during the preceding 6 or 8 years. This was probably due largely to a fair yield of cotton in 1917 and to the unusually high prices prevailing.

By far the most extensively grown crops are cotton and corn, occupying 41,851 and 36,112 acres, respectively, in 1909. Oats occupied 3,254 acres, hay and forage crops 2,974 acres, cowpeas 2,203 acres, sweet potatoes 1,445 acres, sugar cane 1,111 acres, and peanuts 375 acres. The relative importance of the crops has changed very little in the last 30 to 50 years, except that rice was at one time a crop of some importance. In 1879 it was grown on a total of 236 acres and produced 117,099 pounds.

Corn has doubled in acreage since 1880. At the present time it is increasing in importance with the decline in cotton growing and with the development of live-stock farming. The average yield also seems to be increasing as a result of larger supplies of manure available from the dairy and stock farms, and on account of better farming methods.

Cotton increased in acreage until 1910 in about the same proportion as corn. The area devoted to cotton in 1909 was much larger than that 10 years before, although the ravages of the boll weevil had already become apparent. In 1917 there were ginned in Pike County alone 8,500 bales of cotton, grown under boll-weevil conditions on approximately one-half the area reported planted in 1909. On account of the favorable seasonal conditions and an unusually large acreage due to high cotton prices, the crop was considerably larger than the normal for the several years preceding. Cotton is, and doubtless will continue to be, the most important money crop of the county. By growing early maturing varieties and fertilizing the crop so that it will fruit quickly, before the weevils are able to do serious injury, part of it is saved. The proportion varies greatly

¹ These figures include Walthall County, which until 1914 was a part of Pike County.



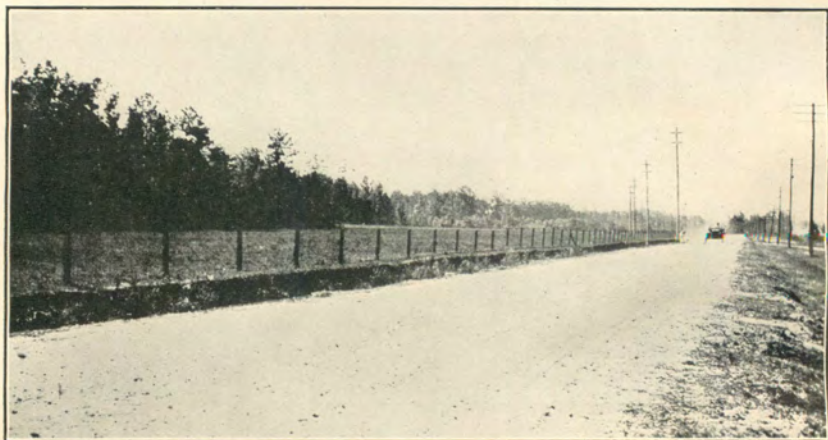
S. 9555

FIG. 1.—TYPICAL SMOOTH, NEARLY FLAT DIVIDE, 3 MILES EAST OF MAGNOLIA.
Soil is the Caddo very fine sandy loam.



S. 9552

FIG. 2.—CHARACTERISTIC DENSE, SWAMPY GROWTH ON STREAM BOTTOMS.
Bottom land of the Bogue Chitto River along the Fernwood & Gulf Railroad.



S. 9958

FIG. 1.—IMPROVED ROAD BETWEEN McCOMB AND MAGNOLIA.



S. 9903

FIG. 2.—STRAWBERRY FIELD, SHOWING CULTIVATION WITH HAND HOES.

with the season, humid conditions being favorable for the rapid development of the weevils, while dry, hot weather retards their increase. The farmers have found it almost necessary to plow under or burn the stalks, weeds, and grass in the fields immediately after the last picking, thus preventing the development of a late brood, and to clean out fence rows, stumps, and logs which might serve as hibernating places during the winter.² Other means of controlling the weevil are followed.

Oats are grown on only about half the acreage occupied in 1879, but the yields seem to be much larger. Owing to an increased use of oats for winter and spring pasture, it is probable that the acreage in 1918 is considerably in excess of that in 1909. The crop is grown to some extent for sale.

Following oats, the crop of most importance for subsistence purposes and as a soil builder is velvet beans. No report was made on this crop in 1910, but considerable plantings were found on most of the farms at the time of the survey. Velvet beans are seeded in the corn. After the corn has been gathered they may be picked or allowed to remain in the fields for forage. They are relished by cattle, horses, and hogs, and on account of their hardness and tough, velvety covering will remain in the field all winter without deterioration. Crushed, hull and all, they are relished by stock, and have a high food value. The vines give a large amount of nutritious forage, and are valuable as a green manure. Many farmers believe that velvet beans will soon become an important cash crop.

Sweet potatoes have been an important crop for many years. They are grown largely for home use, but to some extent for sale. The principal varieties are Nancy Hall, Porto Rico, Yellow Jersey, and Triumph. The yields range from 75 to 200 bushels per acre. Irish potatoes are also grown, but to a much smaller extent, only 110 acres, with a production of 8,140 bushels, being reported in 1909. At the present time there is a greatly increased acreage in this crop, both for home use and to supply the markets.

Sugar cane, for the production of sirup, has for many years been an important subsistence crop and a source of some income. Almost every farmer grows a small acreage of cane, and many sell a surplus of sirup on the local markets. Some sorghum also is grown, both for sirup and forage.

Peanuts are a crop of increasing importance. The 1880 census did not report this crop at all, and in 1889 only 76 acres were grown. By 1909 the acreage had increased to 375 acres, with a production of 16,295 bushels, and there has been a considerable increase since 1909.

² Control measures are explained in full in a recent Department of Agriculture publication which should be in the hands of every cotton grower in weevil-infested territory, viz, Farmers' Bulletin No. 248, "The Boll Weevil Problem."

Peanuts are used largely for fattening hogs, which are turned into the fields, but a part of the crop is harvested. In 1917 approximately 10,000 bushels were harvested in a limited area in the northern part of the county. The nuts sold for about \$1.20 a bushel.

Cowpeas are grown quite extensively as a hay crop, and to some extent for pasturage. Lespedeza also is an important hay and grazing crop.

Vegetables, both for home use and for market, occupy a considerable acreage. The 1910 census reports a total of 744 acres devoted to such crops. The most important vegetables are beans, peas, cabbage, cucumbers, onions, watermelons, and cantaloupes.

The principal fruits grown consist of strawberries, of which a considerable acreage is grown for the market, peaches, pears, figs, and grapes. Pecans are grown to a small extent. The census reports a total of 71 acres in strawberries in 1909. Plate II, figure 2, shows a strawberry field undergoing cultivation with hoes.

There are a few truck gardens in the vicinity of McComb and Magnolia, but almost the entire output is sold locally. The following truck and garden crops were grown in the vicinity of Osyka in 1917, approximately half in Pike County.³

Truck-crop production in vicinity of Osyka, 1917.

Crop.	Quantity.	Estimated net value.
		<i>Dollars.</i>
Strawberries, crates.....	8,000	9,500
Cucumbers, bushels.....	20,000	11,000
Peppers, hampers.....	35,000	12,500
Beans, hampers.....	3,000	3,000
Irish potatoes, bushels.....	1,000	2,500
Peas, radishes, egg plant, etc.....		1,000
Total.....		39,500

Live stock has a rather important place in the agriculture of Pike County. The census reports 212 calves and 3,565 other cattle sold or slaughtered in 1909, 122 horses and mules sold, and 12,170 hogs and 293 sheep and goats sold or slaughtered. The value of all animals sold or slaughtered was reported as \$156,752. Dairy products, exclusive of those used in the home, amounted to \$89,309 in value in 1909, and poultry and eggs to \$98,534. The animal industries are steadily increasing in importance, owing to the ravages of the boll weevil, to the working out of the timber industry, and to the natural advantages offered by the low-priced land and favorable climate. Conditions are being improved by the eradication of the cattle tick.

³ Figures furnished by F. J. Hurst, county agricultural agent.

There are at present about 350 head of registered cattle in the county, mainly Hereford, Jersey, and Holstein. One farm near Fernwood handles large numbers of grade and registered cattle and much stock of other kinds, including hogs, sheep, and goats. At the time of the survey there were 200 head of registered Hereford cattle, 87 registered Duroc-Jersey hogs, and five herds of Angora goats and sheep on this farm. Angora goats are valuable both for their hair and for their work in clearing out underbrush and sprouts. There are a few herds of these goats and many of the common breeds in Pike County. (Pl. III, fig. 1.)

The most important special industry of the county is dairying. There are 55 shippers of whole milk, shipping principally from Osyka, Chatawa, Magnolia, and McComb. Although these dairies are mostly small, with herds of 10 to 25 milk cows, the income is of considerable importance. Dairying has proved profitable and is rapidly increasing. The Jersey is the principal type of dairy cow, and although many of the cows are native scrub stock or ordinary grades, there are some better grade and registered cows of both Jersey and Holstein breeds. New Orleans furnishes the principal market for milk. A creamery at McComb has almost doubled its production during the last year.

The greatest drawback to live-stock raising and dairying is the shortage of dependable permanent pasturage. The early settlers relied principally on the native grasses, which were mainly carpet grass, broom sedge, and crab grass. Wild cane grew luxuriantly in the stream bottoms, and this also supplied good forage. It has been practically killed out by fires and by pasturing, but the other grasses afford excellent pasturage throughout much of the year. To these have been added lespedeza, bur clover, Bermuda grass, and, during the winter and early spring, oats, rye, wheat, and rape. The use of these, supplemented by velvet beans, peanuts, chufas, and cowpeas, makes this an excellent live-stock county, especially well suited to hog raising.

The relation between topography, soils, and crop adaptations is recognized to some extent by the farmers. The flat and poorly drained soils, whether upland, terrace, or stream bottom, usually carry a rather high percentage of silt in the surface soil and have a light-gray or almost white subsoil, or one heavily mottled with gray. Such soils are cold natured, late, and not very well suited to the ordinary farm crops, which thrive best in a deep, well-drained soil. On the other hand, on the steeper slopes, where the surface soil has been removed by erosion and the hard, sandy clay subsoil left at or near the surface, the soil does not take up moisture readily nor conserve that which has been taken up, and hence is not well suited to the ordinary crops. These steeper slopes also frequently carry a high percentage of waterworn gravel, which further reduces their agricul-

tural value. Areas of deep sand or very light sandy loam, whether on the upland, stream bottoms, or terraces, are recognized as less productive than areas having a sandy clay subsoil, which can be reached at a depth of 10 to 15 or 20 inches. Level, poorly drained areas in the stream bottoms and on the terraces are recognized as being suited to lespedeza and oats. Similar soil on the upland is used to some extent for strawberries, since the plants are retarded in growth and escape the late frosts.

Much of the plowing for both cotton and corn is done with one horse plow, and the ground is broken to a depth of only 3 or 4 inches. Some farmers flat-break the ground, using 2 or 3 horses and plowing 4 or 5 inches deep, but the greater part of the planting is done on beds which have been made by "throwing out" the old beds. Cotton is put in with a 1-row planter, while corn, velvet beans, and peanuts are generally planted by hand. Distribution of fertilizer is done by hand or with a fertilizer distributor.

Some of the live-stock farms are well equipped with buildings, including a silo, and have good fences. A larger number of farms, principally those on which dairying is engaged in, have good but less expensive equipment, consisting of 3 to 6 room houses, often new; small barns, a silo, and a small amount of machinery. Aside from these, most of the farms are poorly equipped. Rail and crude picket fences and log cabins with mud and stick chimneys are seen in many sections. Oxen are used to a considerable extent, especially for hauling saw logs, and they are sometimes used in the field. Plate III, figure 2, shows oxen used in road grading.

Little attention has been given to the rotation of crops, and the general custom is to use the best land for cotton year after year. Oats and lespedeza are often sown on lands too poorly drained for cotton. With the development of the dairy business and an increased supply of manure, there seems to be a growing tendency toward systematic manuring and the development of a good crop rotation, but at present commercial fertilizers are relied upon to maintain the productiveness of the soils. In 1910 there was expended for fertilizer \$115,978, or an average of \$44.32 for each of the 2,617 farms reporting an outlay.

The 1910 census reports a total of 3,585 farms in Pike County of an average size of 83.3 acres. In arriving at this average the census counts each tenancy as a "farm." The average individual holding is considerably larger than the figures given indicate. Of the total number of farms the census reports 59.5 per cent operated by owners and 40.4 by tenants. The proportion of tenanted farms is slowly increasing.

SOILS.

Pike County lies within the physiographic province known as the Coastal Plain. In this province the soil-forming material was washed

down from higher lying lands by streams and spread out on an ancient sea floor. Evidence of its deposition by water is to be found in the presence of waterworn gravel similar to that found on the sea beach, to marine shells, the remains of sea life, and the sorted and stratified beds or layers of sand and gravel. Later this vast water-deposited bed was gradually raised, and the surface material slowly changed to soil by processes such as the leaching action of percolating rain water, chemical action (as oxidation), erosion, and the effects of plant life.

Three series of soils derived directly from this Coastal Plain material are recognized in Pike County, the Ruston, Orangeburg, and Caddo series.

The Ruston series is characterized by its good drainage and gray to light-brown surface soil and reddish-yellow to light-red subsoil. This is by far the most extensive and important series of the county, four types being mapped. These are the Ruston sandy loam, fine sandy loam, very fine sandy loam, and loam.

The Orangeburg soils are also well drained and have a gray or reddish-gray surface and a bright-red friable subsoil. Only one member of the series, the fine sandy loam, occurs in Pike County.

The types in the Caddo series are characterized by their light-gray to pale-yellow surface soil, and pale-yellow to yellow subsoil, usually compact and mottled with gray in the lower part of the 3-foot section. Only one member of this series, the very fine sandy loam, is identified in Pike County.

After the Coastal Plain had been raised above sea level, parts of it adjacent to the large stream courses, especially the Mississippi River, were covered with a thin mantle of fine silty material called loess. This is supposed to be of wind-blown origin, carried from the large valleys and spread over the adjacent uplands. It is thickest on the uplands adjacent to the Mississippi River bottoms to the west of Pike County, and thins out toward the east. Probably a larger area in Pike County was once covered with this material, but most of it has been washed away, exposing the underlying Coastal Plain material and leaving but a few loess areas, of no very great extent, in the northern part of the county. Where of good depth and well drained the loess of this region gives rise to the Memphis soils, but none of these are recognized in Pike County. Where there is much gray mottling in the lower subsoil, occurring in a compact layer which interferes somewhat with the internal movement of moisture, it is classed as Grenada. Only one type of the Grenada series, the silt loam, is recognized in Pike County.

Besides the soils forming the uplands and coming direct from the Coastal Plain and loess deposits there are a number of types lying along the streams coming indirectly from these deposits. Most of this material has been washed from the soils of Coastal Plain origin, carried in suspension by the streams and deposited in their present

or former flood plains. During this process the material is assorted, swift currents carrying the coarser sands and gravel, while only silts and clays are carried by slowly moving waters. In other places the material has not been transported for long distances, but simply washed down the slopes into the small adjacent valleys and for short distances downstream. The alluvial soils of the first bottoms, including small areas of colluvial origin, are classed with the Ochlockonee and Bibb series. The Ochlockonee soils are brown and the Bibb gray. Much of the Ochlockonee area has gray and brown mottling in the subsoil. Three types of the Ochlockonee series are mapped, the fine sandy loam, loam, and silt loam. The Bibb soils occupy the poorly drained parts of the first bottoms. They have a gray surface soil and a mottled gray, yellow, and brown subsoil. Iron concretions are common on the surface and in the subsoil. Only one type, the silt loam, is found in this county.

Along all the larger streams and in places along some of the smaller ones there are extensive areas of alluvial (and partly colluvial) soils occupying low benches or second bottoms, representing former flood plains of the streams. These soils are classified in the Cahaba, Kalmia, and Myatt series. The members of the Cahaba series have brown surface soils and a reddish-brown or reddish-yellow, friable subsoil. Three types, the sandy loam, fine sandy loam, and loam are mapped in Pike County. The Kalmia series includes types with gray surface soils and a pale-yellow friable subsoil, usually mottled in the lower part with gray. Only the Kalmia fine sandy loam and loam are mapped in this survey. The members of the Myatt series have pale or ashy gray surface soils and a light-gray stiff subsoil, mottled with yellow and brown. Iron concretions are common on the surface and in the subsoil. The soils are poorly drained. One type, the silt loam, is found in Pike County.

In the following chapters the several types are described in detail, and their relation to agriculture discussed. The table below shows the actual and relative extent of each type:

Areas of different soils.

Soil.	Acres.	Per cent.	Soil.	Acres.	Per cent.
Ruston fine sandy loam.....	148,800	57.1	Cahaba fine sandy loam.....	3,904	1.5
Ochlockonee silt loam.....	17,472	6.7	Myatt silt loam.....	2,560	1.0
Ruston very fine sandy loam...	15,936	6.1	Kalmia loam.....	2,496	1.0
Ochlockonee loam.....	15,296	5.9	Ruston loam.....	2,368	0.9
Grenada silt loam.....	13,376	5.1	Ochlockonee fine sandy loam...	2,304	0.9
Orangeburg fine sandy loam....	11,392	4.4	Kalmia fine sandy loam.....	2,112	0.8
Ruston sandy loam.....	6,336	2.4	Cahaba sandy loam.....	384	0.1
Caddo very fine sandy loam....	6,208	2.4			
Cahaba loam.....	4,928	1.9	Total.....	260,480	-----
Bibb silt loam.....	4,608	1.8			

RUSTON SANDY LOAM.

The Ruston sandy loam consists of a grayish loamy sand passing at about 3 inches into pale-yellow loamy sand or sandy loam and changing abruptly at depths between 6 and 15 inches into dull-red or yellowish-red, friable sandy clay. Usually the subsoil is yellower and more sandy and compact in the lower part, or it may be mottled with yellow and red.

Some areas included with this type have a rather stiff clay upper subsoil, mottled yellowish and red. These represent a soil approaching in characteristics the Susquehanna sandy loam—a heavy, mottled subsoil type not mapped in this area. Another variation from the typical Ruston consists of small areas in the southeastern part of the county which have a reddish-brown loamy sand soil 20 to 30 inches deep, grading into a reddish light sandy clay. Such areas occur in strips along the lower part of the hill slopes adjacent to the larger stream valleys. But one area of this character is shown on the map, the others being too small.

By far the greater part of the Ruston sandy loam is found in the northeastern part of the county. Numerous developments too small to be mapped separately are included with the Ruston fine sandy loam, such areas usually occurring on the steeper slopes and frequently where there is much waterworn gravel.

The sandy loam is considered somewhat lower in productiveness than the finer textured Ruston soils, but there is no great difference, and by supplying manure or vegetable matter in other forms and fertilizer it may be expected to yield about as well as the fine sandy loam. The crops succeeding on the fine sandy loam, such as cotton, corn, velvet beans, sweet potatoes, vegetables, and melons, will give good results. Grass and lespedeza probably will not do so well, however, as on the finer textured soil.

RUSTON FINE SANDY LOAM.

The typical Ruston fine sandy loam has a surface soil of gray loamy fine sand grading at about 3 inches into pale-yellow loamy fine sand to fine sandy loam. At an average depth of 10 inches this is underlain by dull-red to reddish-yellow, friable fine sandy clay, which usually becomes more sandy and more friable in the lower subsoil, that is, at depths ranging from about 18 to 30 inches. In some places this lower subsoil is slightly mottled with yellow and reddish-yellow, and occasionally with gray. In places the lower subsoil is yellower than the upper subsoil, and it is often more compact, even though more sandy. In some places, as in an area about $1\frac{1}{2}$ miles north of Summit, the type is deeper and less loamy than typical. Here the surface soil is a gray fine sand, 5 inches deep, and the subsurface a pale-yellow

fine sand that passes into an upper subsoil of yellow fine sandy loam. At 24 inches the subsoil becomes a dull-red, friable fine sandy clay.

Over a considerable part of the type the soil is heavier in texture and a little browner in color than typical. This variation, which includes most of the type west of Magnolia, consists of a grayish-brown fine sandy loam passing at 1 to 4 or 5 inches into yellow or pale-yellow fine sandy loam. This is underlain at depths between 6 and 12 inches by dull-red or reddish-yellow, friable fine sandy clay, which is usually yellower, more sandy, drier, and somewhat more compact between 18 and 30 inches. On slopes there are occasional eroded patches where the surface material is the reddish sandy clay loam or clay of the exposed subsoil. The type is deepest on the smoother and less sloping areas. Terracing is necessary to protect the steeper cultivated slopes from erosion.

Small, well-rounded quartz gravel and chert fragments are of common occurrence in the surface soil and subsoil, such material in many places constituting the larger proportion of the soil mass. These gravelly areas are shown with gravel symbols. Some patches contain ferruginous concretions, like those found in the Tifton soils of Southern Georgia and Alabama.

The predominant topography is gently rolling to rolling, but there are many level or nearly level areas on the divides. Here the surface soil is often of a finer texture, ranging close to a very fine sandy loam or loam, and in places the color is brown. A brown surface color is also found in many fields where vegetable matter has been incorporated with the soil in liberal quantities.

In the northwestern part of the county the topography is more gently rolling, and the type where adjacent to the Grenada silt loam grades into a very fine sandy loam, some of these areas being extensions of the Ruston very fine sandy loam as mapped in Amite County. In the more rolling areas of the type, as along the Bogue Chitto River, along Bala Chitto Creek, and in many other parts of the county, the soil carries more coarse sand and medium sand than in the more level areas. This is especially noticeable on the steep slopes adjacent to the larger stream valleys, and where waterworn pebbles are present in the soil and subsoil. On the upland between Bogue Chitto River and Topisaw Creek the topography is more broken than in other parts of the county, and the soil is lighter in texture, owing to a higher percentage of fine and medium sand.

The Ruston fine sandy loam forms 57 per cent of the area of the county, and on account of its wide extent and relatively high agricultural value, it is the most important soil in the county. It is the predominant type throughout the central and western parts of the county, and is found to some extent in all parts.



S. 9959

FIG. 1.—HERD OF ANGORA GOATS, VALUABLE FOR THEIR HAIR AND FOR CLEANING OUT UNDERBRUSH.



S. 9960

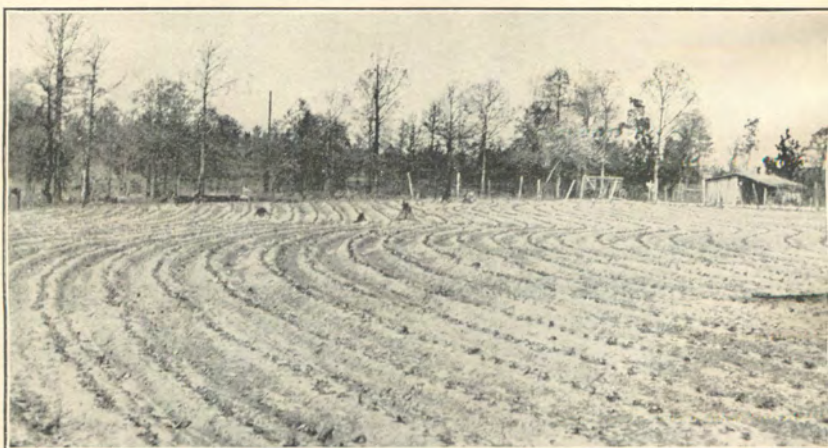
FIG. 2.—TYPICAL CUT-OVER PINE WOODS SCENE ON THE RUSTON FINE SANDY LOAM.

Note the oxen used in road grading.



S. 9857

FIG. 1.—CATTLE GRAZING ON THE RUSTON FINE SANDY LOAM.



S. 9802

FIG. 2.—STRAWBERRY FIELD, SHOWING CONTOUR CULTIVATION.

This soil is the Ruston fine sandy loam.

The surface drainage of this type as a whole is good, but there are some small areas near the summits of the level ridges that are too flat for good drainage, and more extensive areas in which the slope is steep enough to make surface drainage excessive, so that terracing and contour cultivation are necessary. The subsoil of some of the level areas is in places compacted and silty, restricting underdrainage and proper aeration and oxidation. The subsoil of these areas is mottled with light gray and has a stiff structure. They really represent areas of Caddo very fine sandy loam and silt loam, but are included with the Ruston on account of their small size. One such area is included in the grounds of the public school at Magnolia. Considerable areas of the Ruston fine sandy loam contain waterworn gravel and pebbles. The proportion of such material ranges from less than 5 per cent to 50 per cent of the soil mass. Some of these areas are properly a gravelly loam, and if of sufficient extent would be so mapped. These more gravelly areas, however, are usually quite small, covering only a few acres. Areas containing gravel in appreciable quantities, like most of the steeper slopes adjacent to the larger stream courses, are indicated on the soil map by gravel symbols. As a whole this gravelly soil is less productive than the gravel-free areas.

Probably 35 to 40 per cent of the Ruston fine sandy loam is under cultivation. Originally the entire type was heavily forested with longleaf pine, with some mixed forest of shortleaf pine, red and white oak, black hickory, sweet gum, and a few other species. The merchantable timber has practically all been removed, and there has sprung up a rather dense growth consisting principally of blackjack and post oak, with some second growth pine, red oak, and other trees. Plate III, figure 2, shows typical cut-over pine land on the Ruston fine sandy loam.

Where a dense second growth has sprung up, the cost of clearing this land and putting it under cultivation ranges from about \$10 to \$15 per acre, but where the land is not too far from market the wood removed usually pays a large part of the expense. Careful sprouting for two or three years is necessary to kill the post oak and blackjack oak. Probably less than 20 per cent of the cultivated land of the county has been cleared of stumps. The cost of removing stumps varies widely, ranging from \$10 per acre up.

Corn on this type of soil yields from about 10 bushels per acre, where the soil is poor and eroded, to 25 or 30 bushels where it has been built up, fertilized, and well cultivated. In favorable seasons oats yield 20 to 25 bushels.

For winter and spring pasturage winter oats, rye, and, to a small extent, rape are used. The native wild grasses, principally carpet grass and Bermuda grass, furnish the principal spring and summer pas-

turage. Peanuts and velvet beans give large yields of excellent winter feed. Lespedeza furnishes pasturage and also hay of good quality. Many cattle are grazed on this type. Plate IV, fig. 1, shows a herd near Fernwood.

Two and three horse plows are used to some extent in plowing, especially where the ground is flat broken, but the greater part of the plowing and cultivation are done with 1-horse implements. Ordinarily the entire surface is not broken, but middles are opened and the beds of the preceding year turned into the old middles for new beds. Corn is generally listed or planted in the water furrows, while cotton is planted on low beds.

Fertilizers are used on cotton and to some extent on corn. Cottonseed meal, acid phosphate, raw rock phosphate, and ground and steamed bone are the principal fertilizer materials. Home-mixed fertilizers are used to some extent. From 150 to 200 pounds per acre is generally applied to cotton land. Much of the fertilizer is distributed by hand.

Well-located, uncleared land of this type sells at \$10 to \$15 an acre. Land cleared and otherwise improved brings from \$20 to \$40 or more an acre.

The greatest need of this soil is organic matter. Even when first cleared the surface soil of much of the type is low in this ingredient, and lacking in nitrogen. By growing velvet beans, peanuts, and cowpeas and by plowing under the vines, trash, grass, and stalks left after pasturing the soil soon becomes darker, absorbs and holds moisture better, and is much more productive. As organic matter is incorporated the plowing should gradually be deepened until a deep, productive tilth has been formed. Early plowing and plowing broadcast should be substituted for the present practice; the seed bed should be thoroughly prepared, and the crops given frequent shallow cultivations. More attention should be given to preventing erosion by terracing, contour cultivation (see Pl. IV, fig. 2), deeper plowing, and using winter cover crops.

Some crops that are not now extensively grown in Pike County, but which do well on this type of soil, according to experience here and elsewhere in the South, are sweet potatoes, watermelons, cantaloupes, cucumbers, and peanuts. Plate V shows a truck field on this type about $1\frac{1}{2}$ miles south of McComb.

RUSTON VERY FINE SANDY LOAM.

The typical Ruston very fine sandy loam consists of a gray very fine sandy loam passing at 3 or 4 inches into pale-yellow very fine sandy loam and at 6 to 10 inches into reddish-yellow to yellowish-red, friable fine sandy clay. This in turn gives way, at depths ranging from about 18 to 24 inches, to reddish-yellow, friable fine sandy clay

mottled with yellow and red, and in places with gray or bluish gray. The mottled lower subsoil, especially at depths of about 28 inches, is usually less compact than the upper subsoil.

The surface in general is more uneven than that of the Caddo very fine sandy loam, being undulating to very gently rolling. There are some nearly level areas, however, although on most of these the Caddo very fine sandy loam is developed instead of the Ruston. Patches of Caddo very fine sandy loam, Caddo silt loam, and Ruston silt loam are included with the Ruston very fine sandy loam on account of their small extent. The type is not easily distinguishable from the Caddo and Grenada, but the upper subsoil is too red for Caddo, and the subsoil is decidedly too sandy for the Grenada.

Longleaf pine, blackjack oak, post oak, and hickory make up the tree growth on this soil. Most of the pine has been cut.

The principal areas of this type are found in the south-central and southeastern parts of the county, where it occupies the tops and gentle upper slopes of the divides between the small stream courses. The large areas in the extreme eastern and southeastern part of the county seem to be, as a whole, better drained and more productive than the smaller areas near the center of the county.

The Ruston very fine sandy loam is a desirable soil. It is sufficiently well drained to be earlier and warmer than the Caddo and Grenada soils. A large part of the type is under cultivation as compared with the other soils of the county. The same crops are grown, principally cotton, corn, oats, and sugar cane, and approximately the same yields are obtained as on the better areas of the Ruston fine sandy loam. Peanuts, velvet beans, Bermuda grass, lespedeza, sorghum, and rye should do well. The soil should be built up through the growing of legume crops, the use of manure, the plowing under of vegetable matter, and by gradually deepening the plowing.

RUSTON LOAM.

The Ruston loam, as mapped in this county, is a brown or light-brown loam grading into a somewhat lighter colored, yellower, or redder loam at a depth of 5 or 6 inches. This, in turn, at 10 to 15 inches grades into a reddish-brown to reddish-yellow, friable fine sandy clay, somewhat lighter in texture in the lower part; that is, below 28 to 30 inches.

Only a few rather small areas of this type are found in Pike County. They occur principally in the southeastern part. Two areas are crossed by the Magnolia-Dillon Road, $2\frac{1}{2}$ miles southeast of Magnolia. The type has an almost level surface. It usually occurs on the more level parts of the divides, and is surrounded by lighter

soils of the Ruston series. Although it is nearly level, the drainage is good, owing, in part at least, to the friable nature of the subsoil.

The greater part of this type is under cultivation, principally to cotton and corn, but it is also well suited to nearly all the other crops grown in the county. Yields are larger than on any other upland soil. Corn yields from 20 to 40 bushels per acre, and in favorable seasons cotton gives good yields. Owing to its small extent this is not an important type in the agriculture of the county, but it is locally important, owing to its productiveness.

ORANGEBURG FINE SANDY LOAM.

The Orangeburg fine sandy loam is a grayish to light-brown fine sandy loam, 3 to 6 inches deep, grading into a yellowish or reddish heavier fine sandy loam, which is underlain at 8 to 15 inches by red, friable fine sandy clay. The subsoil is frequently more sandy and friable in the lower part, although slightly compact in places during seasons of drought. The color of the subsoil ranges from bright red to deep red. The transition from Ruston to Orangeburg is usually gradual, and in places it is difficult to draw boundary lines.

A few small flat areas of Greenville loam are included with the Orangeburg fine sandy loam. The Greenville soil, as in the small area three-fourths mile west of Magnolia, is a brown to reddish-brown loam, 5 to 8 inches deep, overlying deep-red moderately friable fine sandy clay. An area immediately west of Chatawa contains numerous fragments of reddish-brown ferruginous sandstone. In some areas the soil carries small waterworn chert and quartz gravel, similar to that found in the Ruston fine sandy loam. These gravelly areas are shown on the map by means of gravel symbols.

There are no very large areas of Orangeburg fine sandy loam, but small areas are found in every part of the county. They occur principally in three positions, in long, narrow strips occupying steep slopes adjacent to large stream valleys; along the lower course of small streams near the point where they enter the larger valleys; and around the heads of small rapidly cutting streams that have a steep gradient. All of the type is rolling or broken, and practically all of it requires terracing for profitable farming. Both surface drainage and underdrainage are good.

Where this type occurs in large areas suitable for cultivation, it is one of the most productive soils in the Coastal Plain region, but in this county, on account of its small extent and steeply sloping surface, it is not an important type. Only a small part of it is under cultivation, farmed in conjunction with the associated Ruston soils. It is suited to all the common crops and gives good yields. The uncleared areas support a growth of shortleaf pine, white oak, red oak, and hickory.



S. 8990

TRUCK FIELD ON RUSTON FINE SANDY LOAM, $1\frac{1}{2}$ MILES SOUTH OF MCCOMB, ON MCCOMB-MAGNOLIA ROAD.

The crops shown are Irish potatoes and cabbage.

CADDO VERY FINE SANDY LOAM.

The typical Caddo very fine sandy loam is a gray very fine sandy loam about 3 inches deep, passing into pale-yellow very fine sandy loam, which at 8 to 10 inches grades into yellow or pale-yellow clay containing enough fine or very fine sand to make it noticeably friable. The lower subsoil, below a depth of 15 or 20 inches, is mottled yellow and gray or bluish-gray fine sandy clay, usually compact, especially in the lower part of the mottled stratum, and in places plastic, owing to the presence of a heavy, gray clay along with the more friable yellowish clay. Small concretions are usually present in the lower subsoil, and are not uncommon in the surface soil. In imperfectly drained areas the subsoil is pale yellow, deeper yellow appearing on the slopes where the type quickly grades into the Ruston fine sandy loam, a phase of the Ruston that has a mottled gray and yellow lower subsoil. Apparently the imperfect drainage is due to the imperviousness of the lower subsoil. There are some included patches of Caddo silt loam.

The Caddo very fine sandy loam resembles the Grenada silt loam of the northwestern part of the county, but is not so brown in the surface soil or so strongly tinged with red in the upper subsoil. It contains more very fine sand in the subsoil, and less silt, and is believed to be derived from Coastal Plain material. It is closely associated in the southeastern part of the county with the Ruston very fine sandy loam, but is not so well drained nor so productive as the latter.

The Caddo very fine sandy loam is developed mainly in the extreme southern and southwestern parts of the county. Numerous areas are encountered in the vicinity of Osyka, and two areas of considerable size north of Magnolia. The type occupies level to undulating areas and very gentle slopes. It is not a well-drained soil, although it is not too wet for cultivation.

This is not considered a strong soil, and crops upon it are generally expected to mature late. Probably not over 20 to 25 per cent of the type is under cultivation. Cotton, corn, and oats are the leading crops. Yields as a whole are lower than on the Ruston or Grenada soils.

The greatest need of this soil is better surface drainage, which in many cases can be supplied by open ditches. The type is fairly well suited to the growing of lespedeza and oats, to Bermuda-grass pasturage, and to strawberries. Land values range slightly lower than on the Ruston or Grenada soils.

GRENADA SILT LOAM.

The typical Grenada silt loam consists of a brown silt loam grading at about 3 to 6 inches into light-brown or yellowish-brown silt loam and at about 8 inches into yellowish-brown silty clay loam. At 9 or

10 inches the soil is underlain by dull-red, brownish-red, or reddish-yellow, moderately friable silty clay, which at between 18 and 30 inches passes into yellowish silty clay loam mottled with gray and containing in many places dark-colored concretinary material. In some flats and depressions the upper subsoil is yellow, the mottled layer comes nearer the surface, and there is more gray. The surface material on slopes has been washed away and patches of silty clay loam soil have resulted. A few small areas of Memphis silt loam are included with the type as mapped. The Memphis is similar to the Grenada silt loam, but does not show a well-developed mottled gray layer. It is closely related to the Memphis silt loam, flat phase, mapped in Lincoln County. The subsoil of the Grenada differs from that of the Caddo in being a silty clay rather than a sandy clay. There are included here and there small patches of a very poorly drained gray soil with a whitish, impervious silty clay or silty clay loam subsoil, containing concretions.

The principal areas of Grenada silt loam lie northwest, north, and northeast of McComb. They occupy the divides and the upper parts of the more gentle slopes, having the same relative position as the Ruston very fine sandy loam in the southeastern part of the county. The topography ranges from nearly level to gently sloping and undulating. The greater part of the type has good surface drainage. Underdrainage is moderately good, except where the gray, plastic subsoil lies near the surface, and such areas are of small extent.

This is an important soil type. It is used extensively for cotton, corn, and oats, the yields of which are slightly higher than on the Ruston fine sandy loam. The type is also well suited to *lespedeza*, bur clover, vetch, peanuts, velvet beans, soy beans, and Bermuda grass. It is well adapted to truck crops, such as tomatoes, beans, garden peas, cabbage, and watermelons, and is used extensively for such crops in the Crystal Springs trucking section to the north.

Land values on this type of soil range from \$15 to \$40 an acre, depending largely on the location and improvements.

The productiveness of this soil should be increased by growing legumes, such as velvet beans, and by adding manure. Application of fertilizers, such as mixtures of acid phosphate and cottonseed meal, would also increase the yields.

CAHABA SANDY LOAM.

The Cahaba sandy loam consists of a brown to reddish-brown sandy loam which at 6 to 10 inches grades into a dull-red or reddish-yellow friable sandy clay or fine sandy clay. In many places the soil material contains a relatively high percentage of waterworn gravel and coarse sand, consisting of chert and quartz. The lower subsoil usually is a reddish-yellow or yellow sandy clay, often faintly mottled with rusty brown and pale yellow.

Only a few small areas of this type are mapped. These lie along the Tangipahoa and Little Tangipahoa Rivers, where they occupy second-bottom positions, usually higher than those occupied by the other soils of the Cahaba series. In several places there are at the mouth of small tributary streams delta or fan shaped areas which are composed of sand, gravel, and other soil material washed by these streams from the adjacent uplands.

The greater part of the Cahaba sandy loam is under cultivation, being used principally in the production of cotton and corn. On account of its small extent the type does not hold a very important place in the agriculture of the county, but locally it is very important, being well suited to a large number of crops, such as corn, sorghum, cotton, velvet beans, sweet potatoes, peanuts, sugar cane, and vegetables.

CAHABA FINE SANDY LOAM.

The Cahaba fine sandy loam is a brown to reddish-brown fine sandy loam, grading at 8 to 12 inches into reddish-yellow to dull-red fine sandy clay to silty clay of a moderately friable structure. This clay subsoil may extend to a depth of 3 feet or more without much change, but in many places it grades in the lower part into sandier material, a light fine sandy loam, or loamy fine sand. In places, also, the lower subsoil grades into pale-yellow material, sometimes mottled with gray, making it similar to the subsoil of the Kalmia series. Although fairly uniform as a whole, the Cahaba fine sandy loam includes small areas of Cahaba sandy loam and loam, and in the small depressions areas of Myatt silt loam and Bibb silt loam.

The Cahaba fine sandy loam occurs principally in the north-eastern part of the county along Bogue Chitto River and Topisaw Creek. Holmesville is situated on soil of this type, and relatively large areas in this vicinity have been under cultivation for many years. A few small areas are found along Tangipahoa and Little Tangipahoa Rivers and smaller streams.

This type, like the Cahaba loam, lies only a little—ordinarily 4 to 10 feet—above the adjacent first-bottom soils, and the line of separation is often rather indefinite. It is nearly level, but contains numerous small depressions that are usually occupied by soil of some other series, such as the Myatt. It is rarely flooded by water from the main streams, but in many places is flooded, during periods of excessive rain, by run-off from the adjacent hills and by water from small streams that flow across the terraces. Excepting the depressions, the greater part of the type is well drained.

This soil originally was heavily forested with longleaf and shortleaf pine, oak, hickory, and various other trees. The greater part of it is at present under cultivation, principally in corn and cotton. It is well suited to all the common crops. It is a warmer, earlier

soil than the Cahaba loam, and is well suited to vegetables, sweet potatoes, sugar cane, etc. The yields are generally good. The type can be improved by the means suggested for the Cahaba loam.

CAHABA LOAM.

The Cahaba loam consists of a brown mellow loam, which at 8 to 12 inches overlies a reddish-yellow to reddish-brown friable sandy clay. This in places extends to a depth of 3 feet or more, but over much of the type as mapped it grades at 15 to 24 inches into a light-gray plastic clay or clay loam. Soil of this latter nature is not typical of the Cahaba series in its broad development through the Southern States. The type as a whole lacks uniformity. It includes some Cahaba sandy loam, fine sandy loam, and clay loam, and numerous small areas of Myatt loam and silt loam.

The Cahaba loam is a second-bottom soil lying only a few feet (not over 15 feet) above the adjacent first-bottom soils. Numerous small areas occur along Bogue Chitto River and Topisaw Creek. Smaller areas are developed along Tangipahoa River, Bala Chitto Creek, and some of the smaller streams of the county. The surface is nearly level, except for small depressions and marginal slopes falling away to the Myatt silt loam. The type is not subject to overflow from the main streams, but parts of it are partly flooded at times by water from the adjacent slopes and from the small tributary streams. Artificial drainage by means of ditching would improve part of the type.

Much of this soil has been under cultivation for many years, being used principally for the production of corn, cotton, and oats. Peanuts, velvet beans, and in fact all the crops of the county are grown to some extent. Cotton yields one-half to three-fourths bale per acre, and corn 20 to 45 bushels.

This soil can be greatly improved by growing legume crops, such as velvet beans, peanuts, and cowpeas; by cutting and plowing under corn and cotton stalks, and all other available organic matter; and by growing winter cover crops of oats or rye and pasturing with stock. Among the crops that can be grown successfully are sugar cane, sorghum, sweet potatoes, Irish potatoes, garden vegetables, and lespedeza.

Land of this type ranges in price from \$10 to \$50 an acre.

KALMIA FINE SANDY LOAM.

The surface soil of the Kalmia fine sandy loam is a gray to light-yellow fine to very fine sandy loam grading at 8 to 12 inches into a pale-yellow sandy clay or sandy clay loam mottled with gray. This extends usually to a depth of 3 feet or more, but in places grades in the lower subsoil into a light-gray or almost white, sticky clay

similar to the subsoil of the Myatt silt loam. In the more poorly drained situations the surface soil is shallow and this heavy, gray subsoil predominates. Iron concretions are of frequent occurrence in this type, especially in the more poorly drained places.

Areas of Kalmia fine sandy loam are found along the Tangipahoa River. The eastern part of the town of Osyka is situated on this type, and a large area occupies a broad low terrace near the junction of Bala Chitto Creek and Tangipahoa River. Smaller areas are found in the northeastern part of the county along Bogue Chitto River and Topisaw Creek.

The surface is nearly level, but with numerous depressions such as sinks and the meandering courses of small drainage ways. In such locations the soil is usually not typical, but becomes more gray in color and heavier in texture, resembling the soils of the Myatt series.

With the exception of these depressions the type is fairly well drained. It occupies low terraces only 3 to 10 feet higher than the adjacent first-bottom soils, and parts of it are subject to overflow during periods of unusually high water. Part is also flooded at times by run-off from the upland slopes and by water from the minor tributary streams.

More than one-half the type is under cultivation, but parts of it still are forested with the native growth of longleaf and shortleaf pine, oak, sycamore, magnolia, and other trees of the stream valleys. Gallberry bushes are common. The soil is suited to corn, cotton, oats, lespedeza, velvet beans, peanuts, and garden truck. It is not naturally so productive as the Cahaba fine sandy loam, but where it is well drained and has a good clay subsoil at a depth of 12 to 18 inches it can be built up and made fairly productive. Corn yields 10 to 25 bushels per acre, cotton one-fourth to one-half bale, sweet potatoes 100 to 250 bushels, and sugar cane 100 to 250 gallons of sirup.

KALMIA LOAM.

The Kalmia loam consists of a gray to light-brown loam, 6 to 10 inches deep, grading into pale-yellow sandy clay mottled with gray. The lower subsoil, especially in poorly drained areas, is light gray and has a tenacious, sticky structure like that of the Myatt silt loam. The type is not uniform but includes many small areas of Kalmia and Myatt fine sandy loam.

Only a few small areas of Kalmia loam are mapped. These occur principally along Bogue Chitto River. Very little of the type is under cultivation, but when cleared and cultivated it has much the same crop value as the Kalmia fine sandy loam, although it is not so well drained.

MYATT SILT LOAM.

The Myatt silt loam consists of a gray or mottled gray and brown or rusty-brown silt loam passing at 8 to 15 inches into gray or bluish-gray silty clay loam, mottled in many places with pale yellow and brown. On the surface and scattered through soil and subsoil are numerous small iron concretions. In places these are so abundant in the subsoil that they form a hardpanlike layer. This is the second-bottom equivalent of the Bibb silt loam of the first bottoms. Owing to its slightly higher position and better drainage it is a somewhat more desirable soil for cultivated crops. It is used to some extent for the production of corn, but oats and lespedeza seem to give the best results. In Covington County, Mississippi, a considerable area of this soil has been drained with open ditches and is being successfully used for growing strawberries. Much of the type in Pike County is forested with pine, oak, sweet gum, and black gum.

Artificial drainage, deep plowing, and the incorporation of vegetable matter or manure and commercial fertilizer are necessary for best results with this soil. Possibly lime could be used profitably.

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

Mechanical analyses of Myatt silt loam.

Number.	Description.	Fine gravel.	Coarse sand.	Medium sand.	Fine sand.	Very fine sand.	Silt.	Clay.
		<i>Per cent.</i>	<i>Per cent.</i>	<i>Per cent.</i>	<i>Per cent.</i>	<i>Per cent.</i>	<i>Per cent.</i>	<i>Per cent.</i>
424325.....	Soil.....	0.6	1.6	1.2	5.8	7.2	70.2	13.5
424326.....	Subsoil.....	.8	1.5	.9	3.6	4.7	67.5	21.1

OCHLOCKONEE FINE SANDY LOAM.

The surface soil of the Ochlockonee fine sandy loam is a brown, fine to very fine sandy loam grading at a depth of about 6 to 12 inches into a lighter brown fine sandy loam or silt loam and this frequently in the lower part of the subsoil into a fine sand. In places, however, the lower subsoil is heavier, consisting of a sandy clay or clay loam. The type lacks uniformity, usually being lighter in texture near the stream and grading into a more silty soil away from it. It includes areas of silt loam and loam, and a less well drained phase with considerable mottling of gray in the subsoil. As mapped, there are also included some hummocks on which the soil approaches the characteristics of Cahaba loam.

The principal areas of Ochlockonee fine sandy loam are found along Bogue Chitto River and Topisaw Creek. Much of it has been cleared and farmed for many years. It is well suited to all the crops grown. Corn, lespedeza, and grasses do especially well.

OCHLOCKONEE LOAM.

The surface soil of the Ochlockonee loam is a brown loam, grading at 5 to 10 inches into light-brown or yellowish-brown, heavier loam or clay loam, which becomes heavier and more plastic with depth. In many places the lower subsoil has the light-gray or mottled gray and yellow color and impervious nature of the Bibb soils. The type as mapped is quite variable from place to place. It includes patches of soil of almost every texture from sand to silty clay loam, occurring in such close association that it is impracticable to separate them on the map. There are included patches of brown or reddish-brown soil with a reddish-brown subsoil (representing the Hannahatchee series) and of a dark-colored soil with dark-brown to nearly black subsoil. Along the margins of the areas there is much colluvial material of sandy or silty texture washed down from adjacent slopes.

Some of the small streams have relatively broad flood plains occupied by this soil, but as a rule the bottoms are narrow. The greater part of the type is subject to frequent overflow, but a part is flooded more rarely. Much of it needs better drainage, and either ditching or tiling would be beneficial. Considerable areas of this soil have been cleared and farmed. It is well suited to corn, cotton, oats, lespedeza, peanuts, and various other crops.

OCHLOCKONEE SILT LOAM.

The soil of the Ochlockonee silt loam is a brown, mellow silt loam grading at 8 to 16 inches into a subsoil of lighter brown, slightly reddish brown, or chocolate-brown to yellowish silty clay loam to silty clay. Along many of the small streams the subsoil is quite variable in color and texture. It is often a dark-brown silt loam passing abruptly into reddish, brownish, or yellowish fine sandy loam, sandy loam, or loamy sand. Where the subsoil has a reddish color the soil really represents the Hannahatchee series.

Frequently the lower subsoil is more compact and impervious, contains darker colored concretions, and has a mottled gray or bluish-gray and yellow color. Where this material comes near enough the surface to interfere with drainage the soil is usually gray or mottled gray and brown. Such areas would be mapped as soil of the Bibb series, if they were of sufficient extent to be shown on the map satisfactorily.

Beech, magnolia, ironwood, sweet gum, tupelo, cypress, maple, holly, pine, water oak, pin oak, white oak, red haw, tulip poplar, and star anise or stinkbush are common trees and plants in the dense forests that cover the greater part of this soil.

The Ochlockonee silt loam occurs in the first bottoms of all the larger streams. Along some of the streams it occupies the entire first bottom, but in many places, especially along Bogue Chitto

River, a strip of fine sandy loam occurs adjacent to the stream channel. Even where not outlined on the map there is usually a narrow strip of fine sandy loam or loam along the banks of the stream forming a small natural levee. On the outer edge of the stream bottom there are in many places low, wet, poorly drained areas of Bibb silt loam, many of which on account of their smallness and the difficulty of making an accurate separation are included with the Ochlockonee.

The surface is practically level, except for minor hummocks and abandoned channels. The higher and better drained parts usually lie near the stream channel. The greater part of the type is subject to occasional overflows. Considerable areas are flooded only at times of exceptionally high water.

Much of this type has been cleared, and is used largely for the production of corn and velvet beans. Oats and lespedeza also are grown. A large part of the land is used for pasture. Corn yields 20 to 45 bushels per acre, without the application of fertilizers or manure. Lespedeza and Bermuda grass can be very successfully seeded for hay and pasturage even in the wettest situations.

The areas with a mottled subsoil are less productive than those with a brownish or yellowish, unmottled or only slightly mottled subsoil. If the two soils could be satisfactorily separated on the map the areas with highly mottled subsoil would be classified in a different series.

BIBB SILT LOAM.

The Bibb silt loam has a surface soil of gray or mottled gray and brown silt loam passing at 8 to 10 inches into gray or bluish-gray silty clay loam, which is often mottled with pale yellow and dark brown and in most places contains iron concretions. In some places these concretions are very abundant, forming a layer which has the characteristics of hardpan.

This type is found in the poorly drained parts of the first bottoms of all the larger streams and of many of the smaller streams. A number of areas too small to be mapped separately are included with the Ochlockonee silt loam and loam.

The Bibb silt loam is locally called "crawfish land." Little of the type is farmed, but it is used to some extent as pasture land. Most of it is forested with the usual bottom-land growth of this region, such as beech, sweet gum, tupelo, cypress, holly, maple, ironwood, water oak, pin oak, willow oak, and red haw. Yellow top or crawfish weed, a low-growing weed with a small yellow blossom, is a conspicuous plant in the early spring.

Lespedeza and Bermuda grass for hay and pasturage are probably the best crops for this soil until drainage conditions shall have been improved by canalling the streams and by ditching or tiling the fields.

SUMMARY.

Pike County is situated in the southwestern part of Mississippi, about midway between Jackson and New Orleans, and bordering the State of Louisiana. It has an area of 407 square miles, or 260,480 acres.

The topography in general ranges from undulating to rolling, but there are some rough areas bordering the valleys of the larger streams. The uplands have an elevation of about 400 feet above sea level. The broad interstream divides are generally flat, and the stream bottom lands are level. The larger streams occupy broad, shallow valleys bordered in many places by low terraces. The small streams also, in places, occupy valleys of considerable width, bordered by low, gentle slopes. These streams and their numerous tributaries reach into all parts of the upland, so that drainage is in general well established.

Settlement in this region was begun in 1799 and the county was organized in 1815, the early settlers coming largely from Alabama and Georgia. In 1910 the population, including what is now Walthall County, was 37,272.¹

Pike County has good railroad facilities. Graded public roads are being extended into all parts of its area. New Orleans furnishes an excellent market for dairy and poultry products, live stock, and other farm produce. Shipments are also made to northern markets.

The mean annual rainfall, as recorded at Magnolia, is 60.6 inches. Precipitation is heaviest during the spring and summer months. The mean annual temperature is 66.5° F. The average growing season is 235 days in length.

Agricultural development in Pike County has been very slow. In 1917 72 per cent of the area of the county was reported by the State Tax Commission as wild land. This is principally unfenced "cut-over" pine land. Improved areas range in price from \$15 to \$40 an acre.

The principal cash crops are cotton and corn. To these as sources of income there have been added in recent years live stock, dairy products, poultry, oats, peanuts, velvet beans, sugar cane sirup, lespedeza, garden crops, strawberries, and watermelons. Registered beef and dairy cattle are raised in considerable numbers, and many hogs of good quality are kept.

This region, on account of the cheap land, mild climate, and wide range of crops, offers excellent opportunities for the development of stock raising, as well as dairying, general farming, and truck growing.

The upland soils of Pike County are of loessial and Coastal Plain origin. The first-bottom and terrace soils are derived from the same materials reworked and redeposited.

¹ See footnote on page 7.

Of the loessial soils only one type, the Grenada silt loam, occurs in Pike County. This is an important soil in the northwestern part of the county. It is well suited to general farming.

Of the Coastal Plain soils the Ruston fine sandy loam is the most important. It is found in nearly all parts of the county and is farmed extensively. When first cleared it is not very productive, but it has a good sandy clay subsoil and can be quickly built up.

The Ruston sandy loam, very fine sandy loam, and loam are of small extent, but desirable soils.

Small areas of the Orangeburg fine sandy loam occur in many places, but the type is of too small extent to be important.

The Caddo very fine sandy loam is a rather poorly drained, somewhat late upland soil. Not more than 25 per cent of it is under cultivation.

Of the alluvial soils the most important are the Ochlockonee fine sandy loam and silt loam, which occur principally in the valleys of the larger streams. The Ochlockonee loam, which is partly colluvial, occurs principally in the valleys of the small streams.

The Bibb silt loam is a poorly drained, "crawfishy" soil occupying the lower parts of the first bottoms. It is of some value for grazing but of low value for cultivated crops.

Of the terrace soils the most extensive, as well as the most productive, belong to the Cahaba series. Three types, a sandy loam, fine sandy loam, and loam are recognized.

The Kalmia soils also occupy terraces. They have a gray surface soil and a pale-yellow subsoil. When well drained they are fairly productive, but as a whole they are not so desirable as the Cahaba soils. Two types, the Kalmia fine sandy loam and loam, are mapped in this area.


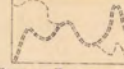
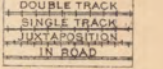
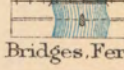
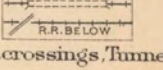
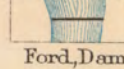
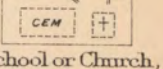

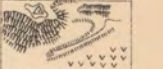
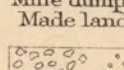
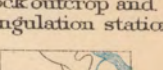
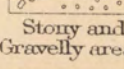
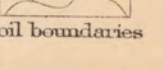
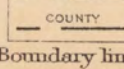
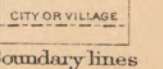
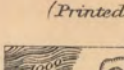
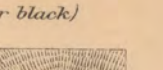
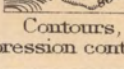
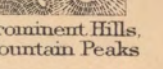
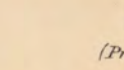

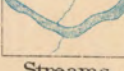


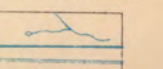
The Myatt silt loam is a poorly drained soil lying on the terraces.



LEGEND

Bibb silt loam BI	Ochlocknee fine sandy loam Oa
Caddo very fine sandy loam Cv	Ochlocknee loam On
Cahaba sandy loam Cl	Ochlocknee silt loam Om
Cahaba fine sandy loam Cs	Orangeburg fine sandy loam O1
Cahaba loam C	Ruston sandy loam Rs
Grenada silt loam Gl	Ruston fine sandy loam Rf
Kalmia fine sandy loam Kl	Ruston very fine sandy loam Ri
Kalmia loam K	Ruston loam R
Myatt silt loam Ml	

CONVENTIONAL
SIGNS

CULTURE (Printed in black)	
	
	
	
	
	
	
	
	
RELIEF (Printed in brown or black)	
	
	
DRAINAGE (Printed in blue)	
	
	
	

The above signs are in current use on the soil maps prepared from this map of earlier date.

[PUBLIC RESOLUTION—No. 9.]

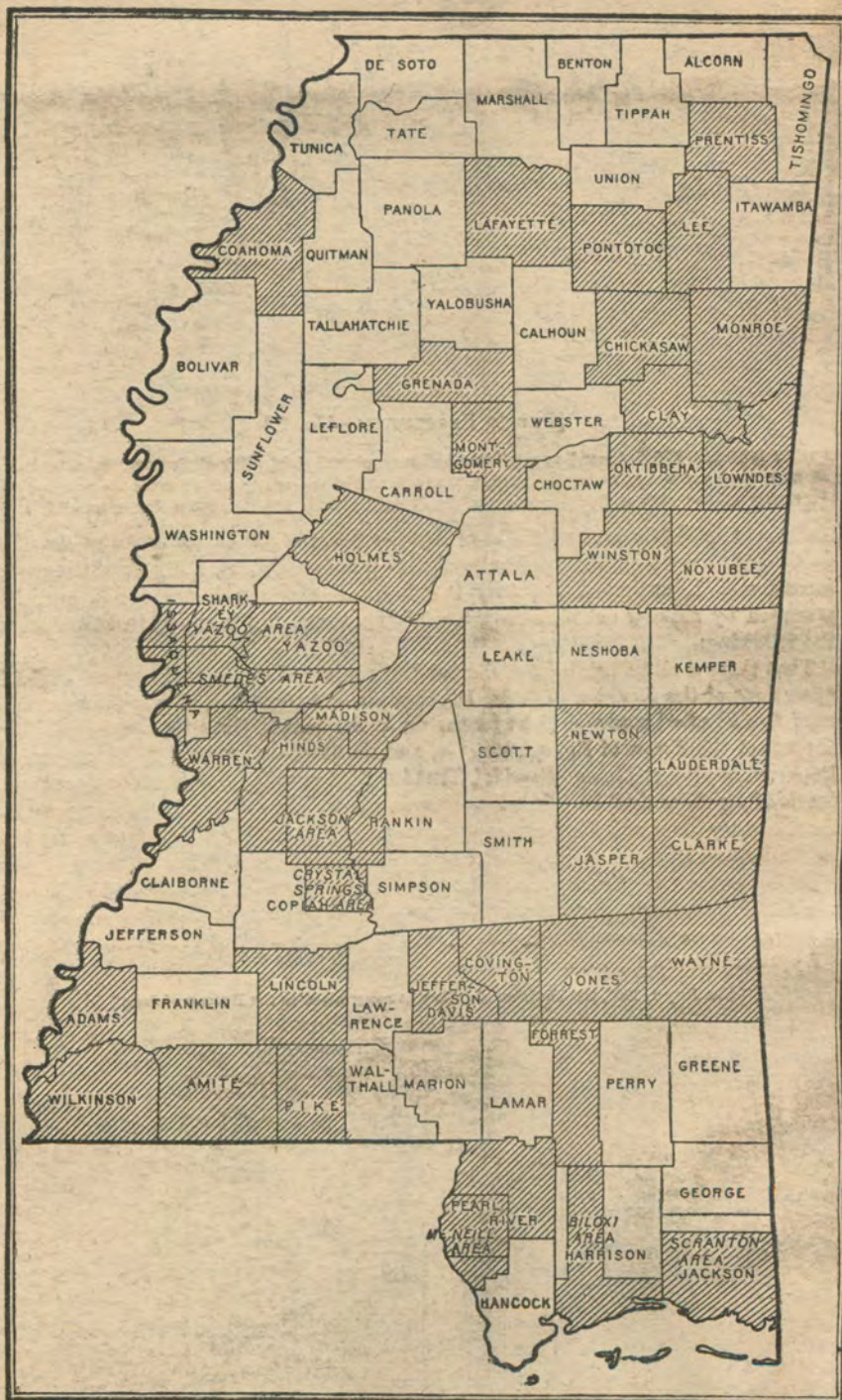
JOINT RESOLUTION Amending public resolution numbered eight, Fifty-sixth Congress, second session, approved February twenty-third, nineteen hundred and one, "providing for the printing annually of the report on field operations of the Division of Soils, Department of Agriculture."

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.]



Areas surveyed in Mississippi.