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

SOIL SURVEY OF MISSISSIPPI COUNTY,
ARKANSAS.

BY

E. C. HALL, T. M. BUSHNELL, L. V. DAVIS, WILLIAM T.
CARTER, JR., AND A. L. PATRICK.

HUGH H. BENNETT, INSPECTOR, SOUTHERN DIVISION.

[Advance Sheets—Field Operations of the Bureau of Soils, 1914.]



WASHINGTON:
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1916.

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LETTER OF TRANSMITTAL.

U. S. DEPARTMENT OF AGRICULTURE,
BUREAU OF SOILS,
Washington, D. C., September 16, 1915.

SIR: In the extension of the soil survey in the State of Arkansas during the field season of 1914 a survey was made of Mississippi County.

I have the honor to transmit herewith the manuscript and map covering this work and to recommend their publication as advance sheets of Field Operations of the Bureau of Soils for 1914, as authorized by law.

Respectfully,

MILTON WHITNEY,
Chief of Bureau.

Hon. D. F. HOUSTON,
Secretary of Agriculture.

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SOIL SURVEY OF MISSISSIPPI COUNTY, ARKANSAS.

By E. C. HALL, T. M. BUSHNELL, L. V. DAVIS, WILLIAM T. CARTER, Jr.,
and A. L. PATRICK.

DESCRIPTION OF THE AREA.

Mississippi County, Ark., is situated in the extreme northeastern corner of the State. It is bounded on the north by Missouri, on the east by the Mississippi River, which separates it from Tennessee, on the south by Crittenden County, and on the west by Poinsett and Craighead Counties.

The county is one of the largest in the State. It has an area of 899 square miles, or 575,360 acres. Its northern boundary is 31 miles in length, its western boundary 38½ miles, and its southern boundary 8½ miles. All these boundaries are straight; the eastern, formed by the meandering course of the Mississippi River, is irregular and about 85 miles in length.

Mississippi County lies wholly within the Mississippi Valley and forms a part of what is known as the St. Francis Basin. It is within the River Flood Plains soil province, and comprises (1) first-bottom lands, including soils which are subject to overflow, or would be if not protected by levees, and (2) second bottoms, or terraces, which are above ordinary overflow and which were formed by streams, probably the Little and St. Francis Rivers, when they flowed at higher levels than at present.

In general, the topography of Mississippi County varies little from a nearly flat and level plain. The general slope and the natural drainage are from the banks of the Mississippi River westward to the western part of the county. Here the surface elevation is about 30 feet less than in the eastern part of the county. The slope from east to west is gradual to the Right Hand Chute of Little River, and the surface is nearly level thence westward.

The surface of the county, although nearly flat, is locally varied by sand mounds, or "sand blows," as they are styled, and by swells or faint ridges, shallow depressions, and the deeper depressions of the stream courses and abandoned stream channels. In such places the surface may be billowy to gently undulating. The sand blows



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

are confined largely to the northern half of the county. There are broad, flattish depressions occupied by the more poorly drained soils, such as the Sharkey clay, which lie from a few feet to perhaps 5 or 6 feet or more below adjoining areas of better drained land. All of the land is topographically suitable for farming, and there are no slopes where erosion can do much damage. In places where the bottoms are unprotected by levees changes by erosion and deposition are still taking place.

Nearly every published map of Mississippi County shows large bodies of water in the northeastern, south-central, and southeastern sections as lakes. Of these only a few, including Big Lake, the largest, are in reality lakes. At the time the original survey was made, in 1845-1849, the land was heavily forested and very swampy and inaccessible to the surveyors. Although the areas designated lakes, with a few exceptions noted, are not under water, they are low and poorly drained.

The area included in Mississippi County was a part of the Louisiana Purchase of 1803. Before this time the region was practically uninhabited, except by the Indians. The county was created by an act of the Territorial legislature in the year 1833, with 960 square miles of territory. Settlement and development were slow. The first permanent settlers are said to have come from Kentucky and Tennessee, and to have settled along the river front. The first town of importance was Osceola. Another early settlement was at a point 1 mile west of Blytheville. All shipping was by boat on the Mississippi River.

The annual overflows of the river were disastrous to the early settlers, and the building of the Mississippi Levee gave a strong impetus to the development of the county. The construction of this levee was begun in 1891-1895, along the whole eastern boundary of the county. Before it was built practically the whole county was inundated during periods of flood.

Prior to the construction of the levees the landowners took very little interest in drainage. Practically all of the county except the higher sandy land along the river front was low and wet for long periods each year. With the protection of the land from overflows the systematic drainage of the low areas was undertaken. The first drainage ditch was constructed in 1895. It demonstrated that the land could be satisfactorily drained, and since that time many drainage districts have been organized, with the result that large areas of land are being reclaimed and utilized for agriculture. Up to the present time approximately 320 miles of dredged ditches (see Pl. I) have been dug or are under construction in the county. The work is progressing in all parts of the county, and thousands of acres of fertile soil have been reclaimed and made available for agriculture.

The natural drainage of the county is from east to west. The streams have only a slight fall, and are shallow and sluggish. The Mississippi River receives practically no surface water from the county. The northern part of the county is drained by Pemiscot Bayou, which is a slow, meandering stream with high banks. It empties into Left Hand Chute of Little River. Little River, Right Hand and Left Hand Chutes, Tyronza River, Buffalo Creek, and Honey Cypress Swamp flow south and southwest through the western part of the county. They are also shallow, winding streams. They carry large quantities of water, but their banks are low in most places, and their channels are not capable of carrying all the run-off water from rains and the discharge from the drainage canals in Missouri, in which State the canals are dredged to the Arkansas line. For the disposal of this excess water no plans have been made. Little River, Big Lake, and Right Hand and Left Hand Chutes receive most of this water and often overflow, the water spreading over large areas of fertile land. However, during the summer and fall seasons all of these streams are practically dry. Buffalo Creek and Honey Cypress Swamp also carry ditch water from Missouri, but have no definite channels. Besides the larger streams there are a number of cut-offs, sloughs, depressions, and bayous which do not carry water except during the higher flood stages. In the southern part of the county Frenchmans Bayou is the only stream of size. It rises north of Bassett and flows southward into Swan Lake.

At the present time the county is thickly settled in the northeastern part and along the river, but in the western part settlement is sparse. In the western section large tracts of land are owned by companies, drainage conditions are poor, and the section is largely inaccessible. The population of the county is reported in the census of 1910 as 30,468, showing an increase of nearly 100 per cent over that reported in 1900.

Blytheville, the largest town in the county, has a population, according to the 1910 census, of 3,849. This town is in the northeastern part of the county and is an important railroad center. It has a large number of manufacturing plants, and one of the largest lumber mills in the South. Osceola, the county seat, in the eastern part of the county, is next in importance with a population of 1,769. It is an important shipping point and is the center of a well-developed agricultural section. Other towns of local importance are Luxora, on the Mississippi River, Manila, Dell, Boynton, Burdette, Wilson, Joiner, Basset, and Frenchmans Bayou.

The county is well supplied with transportation facilities. The Mississippi and Little Rivers afford water transportation, and the

St. Louis & San Francisco Railroad, including the main line and branches; the Blytheville, Leachville & Arkansas Southern; the Jonesboro, Lake City & Eastern Railroad, and the Paragould & Memphis Railroad, the St. Louis Southwestern Railway, and the Blytheville, Burdette, and Mississippi River Railway furnish direct connections with St. Louis, Memphis, Kansas City, and other large markets.

The eastern part of the county is well supplied with wagon roads, but there are very few roads in the western part. The roads are in good condition during most of the summer. From December to April, however, they are as a rule in very poor condition, and during a part of that time are practically impassable. Very little attention is given to road improvement.

CLIMATE.

The climate of Mississippi County is intermediate between that of the corn belt and that of the cotton belt. It is favorable to the production of both corn and cotton, although the latter has always been the predominant crop.

The winters are short and usually mild, while the summers are long and hot. The change from one season to another is gradual. Short periods of freezing weather and of light snowfall occur during the winter. North winds, known throughout the South as "northers," occur at intervals during the winter months, and are accompanied by sudden drops in temperature lasting from 12 to 48 hours. The mean annual temperature is reported as 61° F. For the winter months the temperature averages 40°, and for the summer months about 79°. For the fall and spring it averages about 62°.

The rainfall is fairly well distributed throughout the year, although the greater part occurs during the winter and spring months. The fall has less precipitation than any other season, and this combined with the mild temperatures makes it the most pleasant season of the year, and also favorable for the harvesting of crops. There is ample rainfall for the production of the common crops. The annual rainfall averages about 49 inches. The total for the winter months is about 15 inches, for the spring months 13 inches, for the summer months 11 inches, and for the fall months 10 inches.

The average length of the growing season is 214 days, which permits the production in some cases of two crops the same season. The average date of the last killing frost in the spring is March 30, and that of the first killing frost in the fall is October 30. The latest date of killing frost recorded in the spring is April 17, and the earliest in the fall is October 11.



DRAINAGE CANAL THROUGH SHARKEY CLAY, MISSISSIPPI COUNTY, ARK.

The data in the following table are compiled from the records of the Weather Bureau station at Jonesboro, in Craighead County, just west of Mississippi County, and are representative of local climatic conditions:

Normal monthly, seasonal, and annual temperature and precipitation at Jonesboro, Craighead County.

Month.	Temperature.			Precipitation.		
	Mean.	Absolute maximum.	Absolute minimum.	Mean.	Total amount for the driest year.	Total amount for the wettest year.
	° F.	° F.	° F.	Inches.	Inches.	Inches.
December.....	41.0	79	10	4.56	6.03	7.30
January.....	40.4	82	- 1	6.16	1.80	7.24
February.....	38.7	82	-14	4.21	3.43	2.30
Winter.....	40.0			14.93	11.26	16.84
March.....	52.1	93	1	5.02	4.72	6.36
April.....	62.0	96	27	3.96	3.20	4.24
May.....	71.1	100	33	4.33	1.66	4.74
Spring.....	61.7			13.31	9.58	15.34
June.....	77.9	106	41	4.17	1.27	3.80
July.....	80.8	116	51	3.23	2.95	2.61
August.....	79.6	109	52	3.76	3.20	5.16
Summer.....	79.4			11.16	7.42	11.57
September.....	74.2	102	37	3.76	2.00	12.27
October.....	63.0	98	28	2.66	1.06	2.52
November.....	51.1	84	13	3.49	1.98	6.72
Fall.....	62.8			9.91	5.04	21.51
Year.....	61.0	116	-14	49.31	33.30	65.26

AGRICULTURE.

The early settlers in this county located along the banks of the Mississippi and cleared the highest ridges and hummocks. They cultivated small patches of cotton, corn, and vegetables for home use and raised some cattle and hogs, which were shipped to Memphis by steamboat.

When first settled Mississippi County supported a dense forest growth, consisting of several varieties of oak and gum, cypress, cottonwood, swamp maple, ash, elm, sycamore, hackberry, hickory, walnut, willow, box elder, persimmon, pecan, and honey locust. The removal of this timber has been a slow process, although not so difficult in this county as in many other sections. Large areas are still held by lum-

ber companies, which are rapidly removing the forest growth. After the salable timber has been cut many smaller trees and much underbrush remain, but the cost of clearing is materially lowered. The cost is said to average about \$15 to \$18 an acre.

Following the construction of levees and the establishment of rail transportation there was a marked advance along both agricultural and industrial lines.

Cotton has always been the predominant crop of Mississippi County. In 1879 the census reports a production of 10,430 bales from 13,326 acres, which was but little less than half the improved land in the county. By 1909 the production had increased fourfold, amounting to 42,671 bales from 67,704 acres. The yield averaged nearly two-thirds bale to the acre.

In preparing land for cotton the usual method is to plow the ground in the spring and ridge the soil, or "bed out," frequently over hard ground, without a furrow through the center. The top is then smoothed and the seed planted. When the cotton comes up it is plowed or "scraped" on both sides, leaving the plants on a narrow ridge. The plants are then thinned with hand hoes. Subsequent cultivation is performed with light plows, additional hoeing is done, and finally the plants are left on beds. Four cultivations are usually given the cotton before it is "laid by." A few farmers employ better methods, breaking the land deeper and pulverizing the soil well before planting. The cotton is then planted on the level or only slightly elevated beds. Before the cotton comes up the ground is gone over with a light harrow to break up any crust that may have formed. When the cotton is up it is thinned to one stalk in a hill and is then cultivated shallow with a spring-tooth cultivator once a week until the bottom bolls begin to open. This method requires many more cultivations than the old, and the cost is slightly greater on account of the requisite improved implements and additional expenditure of time, labor, and power. Some farmers use selected seed.

The average yield of cotton for the county is two-thirds bale per acre. Often 1 to $1\frac{1}{2}$ bales are produced under good management. The cost of picking varies from 50 cents to \$1 per hundred pounds, according to the labor available. Wilt is the worst disease of the cotton. To combat it, wilt-resistant varieties are grown and crop rotation practiced.

Corn, although grown on only about half the acreage devoted to cotton, ranks next in importance among the crops. The amount of corn produced has increased from about 300,000 bushels in 1879 to 1,108,364 bushels in 1909. The area in corn in 1909 was 34,356 acres, which is only about a third of the total acreage of improved land in farms and a little less than 10 acres per farm.

Corn is not grown as a money crop like cotton but mainly as a subsistence or maintenance crop. Most farmers put in a small field of corn if they have time after giving the cotton crop attention. Generally the ground is poorly prepared and the seed planted on high, cloddy ridges. Corn is usually cultivated about three times. Under the better system the ground is thoroughly plowed to depths of 8 to 12 inches, the seed bed well pulverized by plowing and harrowing, and in some cases rolling to break up the clods. The corn is cultivated once a week usually until silking begins. With better methods of cultivation adaptable land gives 75 to 100 bushels of corn per acre in good seasons.

Cotton and corn cover an area of about 102,000 acres, leaving only about 27,000 acres for all other crops, most of which are subsistence and maintenance crops. There were 3,038 acres in hay and forage in 1909, of which alfalfa occupied 1,405 acres, or more than one-third, the remainder being devoted mainly to tame grasses. The production was 6,745 tons, of which 4,337 tons were alfalfa. The yield of alfalfa was about 3 tons per acre. Alfalfa was introduced in the late nineties. Its importance has increased since then, but has had little effect on the two predominant crops of the county.

The only cereal grown besides corn is oats, and it has never been important. Farmers state that oats can be imported cheaper than they can be grown. This grain was grown on only 47 acres in 1909 and the production is reported as 882 bushels. The crop does best on the well-drained soils.

There was a total area of 377 acres in potatoes in 1909, or an average of but little more than a tenth of an acre per farm. There were 172 acres in sweet potatoes, and 892 acres in other vegetables. Irish potatoes are successful, giving good yields. Two crops can be produced each year. The light sandy soils along the eastern boundary of the county are well suited to potatoes, and with proper cultural methods 200 bushels per acre is probably a conservative estimate of the ordinary yield. Sweet potatoes do well on the sandy soils. Along the Mississippi River such soils are also well suited to the production of watermelons and cantaloupes. The Sarpy fine sandy loam and very fine sandy loam especially are adapted to these crops. Melons, however, are not grown for market.

Cowpeas are grown to some extent, and make a rank growth of vine, with good yields of seed. Cowpeas are sometimes sown broadcast, but generally they are drilled between the rows of corn at the last cultivation. The vines are usually cut for hay. Often, after the corn is gathered, hogs are turned in to forage on the peas. Cowpea hay yields 1 ton to 1½ tons per acre. The light sandy soil types are benefited by the growing of this legume and its plowing under as a green

manure. Some peanuts are grown for hog forage and for hay, and rape, velvet beans, and soy beans are also grown for forage.

Red clover makes an excellent growth on well-drained Sarpy soils, while white clover grows wild along the roads. Japanese clover or lespedeza grows wild in all parts of the county. Timothy succeeds, but is not grown extensively.

Bermuda grass grows luxuriantly on practically all the soils. It is valuable for pasturage or for hay. Bermuda and Johnson grass are hard to eradicate where they gain a foothold.

There are no commercial orchards in the county. Apples, peaches, plums, pears, and cherries are grown in a small way for home use. The 1910 census reports 4,259 apple trees and 5,344 peaches and nectarines. Grapes are an important small fruit. Blackberries grow wild, producing abundantly. They do well on nearly all the soils. Strawberries are not grown except in an incidental way for domestic use, although the soil and climate are well suited to them. The native pecans generally make a vigorous growth and fruit well, but there are no pecan groves of importance.

The 1910 census reports a total of 5,669 dairy cows in Mississippi County, or an average of less than 2 cows per farm. A few cows are kept by farmers living in the vicinity of the larger towns to supply milk to the local markets. Cattle raising for market is likewise in-extensive. The total number of cattle in the county, including dairy cows, is reported as 15,454, or a little over 4 per farm. There were 4,765 head of cattle sold or slaughtered in the county during the year 1909.

During 1909 there were 12,527 head of swine sold or slaughtered, an average of less than 4 per farm. While this number doubtless represents more than a maintenance supply for the agricultural population, it is not sufficient for the whole population of the county, and pork products are imported.

The receipts from the sale of all animals for the year 1909 amounted to \$172,463, or nearly \$50 per farm, and the receipts from poultry and eggs sold amounted to a little more than \$6 per farm. Comparison of these figures with the income from 42,671 bales of cotton, approximately \$700 per farm, shows that the animal industry of the county is decidedly subordinate to the two staple crops.

Some recognition is given to the adaptation of the various soils to certain crops. The differences in topography in the county are too small to influence the kind of crops grown or the agriculture generally, except where the topography affects the drainage.

Cotton and corn are grown on all the soil types of the county, giving good yields on all the well-drained land. On the poorly drained soils cotton has a tendency to "go to weed," or to grow large plants, and not fruit so heavily. On the sands it gives fair yields,

but not so heavy as on the soils of intermediate texture. Corn produces best yields on the well-drained, dark-colored types of intermediate texture. Alfalfa has been confined almost entirely to the Sarpy soils, though some fields on the well-drained Sharkey clay are successful. Since the other crops are grown for domestic subsistence or the maintenance of stock and are grown on every farm regardless of the soils, there is no attempt to adjust them to certain soil types.

Mississippi County, according to the 1910 census, comprises 3,530 farms. A little over one-third of the county is in farms. The average size of the farms is about 51 acres, each tenancy being considered a farm, and of this 36.5 acres are improved. The total area of improved land is reported as 128,872 acres.

SOILS.

The material giving rise to the soils of Mississippi County is of alluvial deposition. It varies from place to place in texture and in the degree of weathering to which it has been subjected.

The texture of the soils ranges from medium sand to clay. The development of many of the types is in belts having a northeast-southwest direction, paralleling in a general way the course of the Mississippi River. The lighter or sandy soils occur along the river front, and the material grades toward the west into the heavier clay soils of the Sharkey series.

Small mounds of medium to coarse sand called "sand blows" are scattered over the northern part of the county north of the latitude of the south boundary of township 13. Each sand blow consists of a pile of sand ranging from a few inches to about 3 feet high in the center sloping radially to the boundary. The diameter ranges from 8 to 25 feet, or occasionally more. The sand varies somewhat in color and in texture, but the central core is always loose and incoherent. Under cultivation the thin or border part of the blow becomes mixed with the underlying material, modifying the latter and being modified by it. A sandy loam is usually formed which is nearly as productive for corn and alfalfa and often equally or more productive for cotton than the heavier soil between the blows. In places the blows have been covered since formation by a silt or clay layer. When this is 4 inches thick or more the resulting soil is about as productive as the soil free from blows. In the center of the blows not covered with clay, where the soil necessarily consists of sand, the productivity is considerably less than that of the sand-free part of the type. It will be seen, therefore, that, even where the sand blows cover 15 per cent of a given soil its productivity has not been decreased in the same proportion.

Prior to the construction of the Mississippi levee the soils of the county were changed from time to time by the flood waters. Except

during the break in the levee which occurred at Wilson in 1913, no soils have been deposited by the Mississippi River for some time. The land on the river side of the levee is undergoing continual change through erosion and the deposition of soil material, but this land has a small area and is of little importance.

The soils of the county may be divided broadly into two groups: (1) The first-bottom soils, or those subject to overflow, and (2) the terrace, or second-bottom, soils, which occupy a higher position and lie above normal overflow.

The first-bottom soils are included in four series, the Sharkey, Sarpy, Yazoo, and Wabash. Texturally the Sarpy soils are high in medium, fine, and very fine sand, while the soils of the other series contain a greater proportion of silt and clay.

The most important series of the first bottoms is the Sharkey. The soils of this series occupy practically all of the western two-thirds of the county. They occur in slightly lower positions than the Sarpy series, and are in part very poorly drained and covered with a heavy forest growth.

The Yazoo soils are among the poorest in the county. The Wabash series is not important agriculturally. It occurs in the northwestern part of the county.

The second-bottom, or terrace, soils consist of material deposited by the Mississippi and Little and St. Francis Rivers when the overflows reached higher levels than at present. These terraces lie west of Big Lake. They extend to the county line on the north and west and gradually grade on the south into the first-bottom soils along Right Hand Chute. The soils of the second bottoms are placed in the Lintonia and Calhoun series. They are prevailingly sandy. Of the terrace soils the Lintonia are the more important, the Calhoun occurring generally as small areas in poorly drained situations. Many large sand blows are scattered irregularly over the terrace soils.

Some of the soils are easily distinguished by the native vegetation. The typical Sharkey clay supports a heavy growth of cypress and tupelo gum, while the better drained phase of the type is usually covered with hickory, elm, ash, and sycamore, and with a dense undergrowth of cane. Pecan trees seem to do best on the light, better drained Sarpy soils, while walnut and persimmon flourish on the Lintonia soils. The low, poorly drained areas, consisting mainly of sand, support a growth of honey locust and some cypress, while tracts known as "flag openings" are covered with flags, swamp grass, pond lilies, and other water-loving plants.

In subsequent chapters the several soil types are described in detail and the accompanying map shows their distribution. The following

table gives the name and the actual and relative extent of each type mapped in Mississippi County :

Areas of different soils.

Soil.	Acres.	Per cent.	Soil.	Acres.	Per cent.
Sharkey clay.....	246,336	64.7	Lintonia sandy loam.....	8,640	1.5
Better drained phase.....	126,080		Wabash clay.....	8,384	1.5
Sarpy silty clay loam.....	25,152	5.1	Sarpy fine sandy loam.....	5,632	1.0
Poorly drained phase.....	4,096		Lintonia silty clay loam.....	5,440	.9
Sarpy clay.....	17,920	3.4	Calhoun silt loam.....	3,520	.6
Poorly drained phase.....	1,792		Yazoo clay.....	3,136	.5
Sarpy very fine sandy loam...	18,688	3.3	Yazoo very fine sandy loam..	2,368	.4
Calhoun sandy loam.....	17,216	3.0	Sharkey very fine sandy loam.	1,664	.3
Yazoo silty clay loam.....	16,320	2.8	Meadow.....	1,472	.3
Lintonia silt loam.....	15,552	2.7	Sarpy sand (with included areas of Sharkey clay).....	1,344	.2
Yazoo silt loam.....	12,672	2.2	Overwash.....	576	.1
Sarpy silt loam.....	12,352	2.2			
Lintonia fine sandy loam.....	9,664	1.7			
Sharkey silty clay loam.....	9,344	1.6	Total.....	575,360	

SHARKEY SERIES.

The Sharkey soils are yellowish brown to drab, with mottled rusty-brown, bluish, drab, and yellowish subsoils of plastic structure. In the slight depressions where water stands for a large part of the year organic-matter accumulations impart a nearly black color to the soil. The types contain a high percentage of clay in both soil and subsoil. These soils occur as bottom lands subject to overflow from the Mississippi River. The component material was mainly deposited some distance back from the river by quiet water. On drying the soil cracks readily, forming small aggregates, and this condition gives rise to the local name, "buckshot land." The natural surface drainage of these soils is imperfect, and they are subject to frequent overflows when not protected by levees. Three members of the Sharkey series, the very fine sandy loam, silty clay loam, and clay, are recognized in Mississippi County.

SHARKEY VERY FINE SANDY LOAM.

The surface soil of the Sharkey very fine sandy loam is a brown or light-brown very fine sandy loam, usually containing considerable silt, which gives it a soft, velvety feel. On drying the surface becomes very light in color, being light brown to grayish. The depth of the surface soil ranges from 4 to 18 inches, the average being about 8 inches. The subsoil is a drab or bluish silty clay, mottled with rusty brown. Frequently the color of the subsoil becomes lighter with increasing depth. In places there is a surface mantle of silty clay an inch or so in thickness.

The Sharkey very fine sandy loam is very limited in extent in this county. It occurs in a few small areas in the southeastern part near the Mississippi River, in the vicinity of Wilson, aggregating but a few hundred acres in extent.

The soil is of recent origin, having been formed mainly during the overflows in 1911 and 1912. It was formed within short distances of points at which the levee broke, and consists of very fine sand sediment which was washed through the levee breaks and deposited over areas of Sharkey clay. The type, therefore, consists simply of Sharkey clay covered with a thin, uniform deposit of very fine sandy loam.

The type has a practically level topography and poor drainage. However, it dries out sufficiently to permit cultivation. Ditching removes the surface water rapidly and facilitates the growing of crops.

The natural vegetation is about the same as that on the Sharkey clay, consisting of sweet gum, cypress, hackberry, water oak, and other trees.

A large part of the land has been cleared for cultivation, but owing to the late season during the last two years, the result of overflows, crop production has not been satisfactory. Cotton and corn have been planted on this soil, but conditions have been such that its producing capacity has not definitely been determined. Late corn planted after the flood water had receded yielded quite well, and indications are that the land will produce good yields of this crop. Cotton and vegetables also should yield well. This soil is loose and friable and easily cultivated.

Owing to its small extent the Sharkey very fine sandy loam is not an important soil in this county.

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

Mechanical analyses of Sharkey very fine sandy loam.

Number.	Description.	Fine gravel.	Coarse sand.	Medium sand.	Fine sand.	Very fine sand.	Silt.	Clay.
		<i>Per cent.</i>						
460847.....	Soil.....	0.0	0.1	0.1	6.6	53.8	33.7	5.8
460848.....	Subsoil.....	.0	.4	.4	2.6	3.6	47.6	45.5

SHARKEY SILTY CLAY LOAM.

The surface soil of the Sharkey silty clay loam is a brown to dark-brown silty clay loam about 5 to 8 inches deep. It is underlain by mottled dark-drab and rusty-brown plastic silty clay, which usually passes below into mottled drab or gray and rusty-brown silty clay. Often

in the lower subsoil, at 24 to 30 inches, a yellow sticky clay, mottled with drab, is encountered. Some lime concretions are found in the subsoil in places. The surface inch or so is a silt loam in places.

The Sharkey silty clay loam is not extensive in this county. The largest areas are those east of Shawnee and the strip extending westward from Evadale along the Deckerville Branch Railway through Wardell and southward to within about 1 mile of Frenchmans Bayou. Other areas of smaller size are scattered irregularly over the county. Small areas of Sharkey silt loam and Sharkey clay, better drained phase, are included with this type as mapped where they are so intricately associated with it as to make their separation impracticable.

In places in the Sharkey silty clay loam sand blows are found, and where these occur to a sufficient extent the symbol is used to designate sand-blow areas. They are not of common occurrence on this soil. The sand blows of this type occur invariably along streams. The largest sand-blow areas lie one-half mile east of Gosnell, near Pemiscot Bayou, and near Athelstan. Their total extent is probably not more than 1 square mile. Within these areas there are a number of minor developments of other soils, too small to be shown on the soil map. The areas are nearly all under cultivation, mainly to cotton and corn. The yields are a little lower than on the typical soil.

The typical Sharkey silty clay loam occupies the same position in regard to elevation as does the better drained phase of the Sharkey clay. Practically all of it is protected from inundation by levees, and drainage canals have been constructed to carry off surface water after rains, so that by artificial means this type has been given fairly good drainage, and most of it is cleared and in cultivation.

The Sharkey silty clay loam is easier to handle than the Sharkey clay, owing to its more friable soil, but where plowed under dry or wet conditions it is likely to turn up in clods. As with the clay, these clods crumble and pulverize after exposure to sun and rain. Most of the type is planted to corn and cotton. Bermuda grass, alfalfa, oats, sorghum, cowpeas, and other forage crops succeed.

This constitutes one of the best soils of the county. Where improvements have been made it is held at \$75 to \$100 an acre.

SHARKEY CLAY.

The Sharkey clay in its typical development consists of a dark-drab silty clay, mottled with shades of brown. This passes at about 4 to 6 inches into sticky silty clay of a mottled drab or dark-drab, rusty-brown, and brown color, the drab color generally predominating and becoming more prominent with increase in depth. The lower subsoil is frequently of a drab or steel-blue color with occasional brownish

mottlings. In some places the lower subsoil, particularly on the slight mounds and ridges or swells, is light yellow or mottled yellowish and drab. The yellowish clay is very sticky. Occasionally pockets or thin layers of sandy material are encountered, but the greater part of the type consists of silty clay from the surface downward throughout the 3-foot section. In some places the immediate surface is almost black and is slightly more friable than the average of the type.

In the northern part of the county there are large sand-blow areas of Sharkey clay, which are designated by symbol. Another development of the Sharkey clay is mapped as the Sharkey clay, better drained phase. This soil occurs at a higher level than the typical. Some small bodies of this phase is included with the typical Sharkey clay, but only where it is so intricately mixed with the dominant soil or occurs in such small areas as to make separation impracticable.

The Sharkey clay, with its phase, occupies a considerably greater total area than all the remaining soils of the county. It occurs in some very large areas. Its most extensive development is in a strip extending from the State line between Big Lake and Pemiscot Bayou, southward along Right Hand and Left Hand Chutes of Little River and Tyronza River to the Poinsett County line, including areas locally known as Tyronza Lake, Hickory Lake, Crater Lake, and Moon Lake. Within this great area of Sharkey clay are small areas of Sarpy soil, and it is interrupted by areas of the better drained phase of the Sharkey clay.

The Sharkey clay occurs in low positions of very poor drainage. It occupies low bottoms, old channels, sloughs, and depressions locally known as lakes. On account of its low position this type is frequently inundated. It is rarely dry between January and June, and only a very small part of it is under cultivation.

This is a very fertile soil, and with proper drainage it constitutes highly valuable agricultural land, perhaps the best in the county. The construction of drainage canals is expensive, but the work is progressing rapidly in all parts of the county (see Pl. I). Money is raised for the work by an assessment upon the lands to be improved.

This soil has been shown to be well adapted to corn, cotton, and grasses. Rice is successfully grown on it in some portions of the Mississippi bottoms. In properly drained and improved fields corn yields 40 to 70 bushels and cotton 1 bale or more per acre. Among the crops that have been found to succeed elsewhere are oats, cow-peas, lespedeza, Bermuda grass, sorghum, and soy beans.

This type is locally called "swamp" or "lake" land. It is widely known as "buckshot land," on account of the tendency of the soil to break into small aggregates. This tendency of the Sharkey clay throughout the Mississippi bottoms is advantageous for the reason

that the soil is so adhesive when moderately moist that it is extremely difficult to manipulate. In consequence of this, the usual custom is to plow either when very wet, or when well dried out and in the crumbly stage. Ordinarily clays, other than the calcareous clays, as heavy as the Sharkey would puddle and bake disastrously if plowed in such wet condition. Instead of baking upon drying this wet-plowed land usually crumbles to a desirable tilth, or, where clods are formed, the first rain crumbles them. This apparently is due to a good content of both lime and organic matter. No fertilization is necessary for good yields where the land is properly handled.

Deposits from overflow waters of the Mississippi, Little, and St. Francis Rivers have formed this type of soil. It was deposited from very slowly moving or still waters. At each inundation a covering of this material is left. The occasional occurrence of sand spots and of soils of different textures has resulted from deposition of the coarser material under peculiar conditions of current.

At present practically all the type is forested. It supports a heavy and valuable growth of cypress, tupelo gum, sycamore, water maple, hackberry, elm, and willow. Before the Sharkey clay will rank as one of the important agricultural soils of the county a very large amount of clearing and improving is necessary. Much of this land at the present time is practically inaccessible, except by boat, during periods of high water. The Sharkey clay from Big Lake southward is under water a few inches to several feet in depth for several months each year. Much of it will be made immediately accessible with the completion of the drainage projects.

The value of the typical Sharkey clay land at present ranges from about \$25 to \$40 an acre for cut-over land without improvements, and from about \$60 to \$80 an acre for land in timber.

Sharkey clay areas with sand spots are shown on the map by sand-spot symbols where approximately 15 per cent or more of the land is covered by such spots. The sand blows occur as irregularly shaped mounds or hummocks ranging from a few inches to about 2 or 3 feet above the clay land between. In some places they are very numerous, especially in the northern part of the county, and cover half or more of the total surface extent in places. Large typical areas occur northeast of Blytheville in sections 34, 35, 36, 25, and 26, T. 16 N., R. 11 E., and sections 2 and 3, T. 15 N., R. 11 E. This vicinity is known locally as "Flat Lake." In this body of Sharkey clay, these sand-blow areas are separated by "flag openings." The soil in these is practically the same as that surrounding them, but they support no timber growth except some willow and cottonwood. The sand-blow areas surrounding the "flag openings" are covered with a heavy growth of cypress and tupelo gum. Other large areas of this sand development are scattered irregularly over the entire county.

The material constituting these sand spots is quite variable, but consists mainly of a brownish to yellowish-brown sand, sandy loam, loam, and in spots sandy clay. Often the sand extends to a depth of 3 feet or more, becoming coarser in texture and lighter in color with increased depth. Usually lighter colored or orange sand or coarse sand is reached at shallow depths, and this is underlain at about 20 to 24 inches by a drab, plastic, silty clay mottled with shades of brown.

The typical Sharkey clay occurs between the sand blows. On every side of the sand spots sand has been washed out over the Sharkey clay, giving rise to small spots of loam, sandy loam, and sandy clay loam. These spots are too small to be shown on the map.

The sand-blow areas of the Sharkey clay occupy low, poorly drained situations. In those parts of the county where most of these areas occur there are a large number of shallow depressions and bayous, which represent old stream channels.

Practically none of these areas are in cultivation. They are covered with a heavy growth of cypress, tupelo gum, sycamore, elm, hackberry, honey locust, and willow. This soil is not so valuable as the typical Sharkey clay, for the reason that on the sandy land the yields are decidedly inferior. Cotton and corn are the only crops grown.

As with the typical Sharkey clay, before this variation can be made an important agricultural soil much improvement in the way of clearing and road building is necessary. At present much of this land is practically inaccessible because of the lack of roads. Adequate drainage must be established before use can be made of much of it.

For the timber they support these areas have about the same value as the typical Sharkey clay, but when cleared and improved they will not command so high a price as an agricultural soil. Present prices of this land are practically the same as those of the typical Sharkey clay.

Sharkey clay, better drained phase.—The surface soil of the better drained phase of the Sharkey clay is a brown to dark-brown silty clay, frequently mottled with rusty brown and drab. This is underlain at shallow depths, about 5 to 8 inches, by sticky, plastic clay, characteristically mottled drab, brown, and rusty brown, the mottling generally becoming more intense with depth. In places the subsoil is mottled yellowish and drab. Included areas as mapped have a thin surface layer of silty clay loam. The surface soil crumbles upon drying into small aggregates. This characteristic has given rise to the name of "buckshot land."

The better drained phase of the Sharkey clay occupies large areas in the eastern and southern parts of the county, and the phase is prominent all along Pemiscot Bayou and Left Hand Chute.

This soil occupies nearly level areas that lie sufficiently above the typical Sharkey clay to have considerably better drainage. This is the main reason for making the separation between the two soils. Although it is better drained than the typical soil, the productiveness of this soil is greatly benefited by artificial drainage. In places where tile drainage has been provided in addition to the ditches a marked improvement has been shown in the productiveness of the soil.

The native forest growth on this phase consists mainly of gum, sycamore, hackberry, cottonwood, and elm, with some cypress, hickory, and walnut. Much of the original growth is still standing in the west-central part of the county. One of the most characteristic forms of vegetation on this phase is wild cane, which in places grows so thick that it is impenetrable. A mark of distinction between the typical Sharkey clay and this phase is made by this growth, no cane growing on the poorly drained Sharkey clay. On cut-over land which has been allowed to remain uncleared for a few years there is a jungle of vines and underbrush.

While the Sharkey clay, better drained phase, is one of the strongest soils in the county, it is heavy and plastic and requires care in cultivation. Where well drained and properly cultivated it produces an average of 1 bale of cotton and 50 to 70 bushels of corn per acre, and in favorable seasons slightly larger yields. Alfalfa, cowpeas, millet, and a number of other crops give excellent results. Alfalfa is grown with marked success on this soil in various parts of the Mississippi bottoms.

In general this phase represents the best soil in the county. Depending upon improvements, locality, etc., the present value of typical land of this phase is \$50 to \$100 an acre.

Sand blows occur on this phase, as on the typical Sharkey clay, and are designated on the map where pronounced. They occupy a higher position than the sand-spotted areas of the typical Sharkey clay, and are therefore better drained, though during dry weather the difference is very slight. The sand blows are irregular in size and outline and in distribution. Most of the areas are in cultivation and the sand mounds are less prominent than in uncultivated tracts. The surface material of the sand blows varies in texture from loam to clay. It is brownish in color, the clay being somewhat mottled with rusty brown and drab. Yellowish-brown to orange sand or even coarse sand, often loamy, is reached at depths ranging from about 3 to 10 inches. This may extend to a depth of 3 feet or more, but typically clay is usually encountered at less than 3 feet.

The sand-spotted areas of the better drained phase are large and are important agriculturally in the county. Most of such land is

found in the northern half of the county, the most typical areas lying northwest of Osceola and north of Luxora. Much of the Sharkey clay, better drained phase, is marked with the sand-area symbol.

In the eastern half of the county most of this land is in cultivation. The sand spots considerably lessen its value for crop production. Cotton is the main crop. Corn and oats also are grown. Cotton produces one-half to three-fourths bale per acre, corn yields from 35 to 55 bushels, and oats from 30 to 40 bushels.

SARPY SERIES.

The soils of the Sarpy series are brown in color. The subsoils range from light brown to pale yellowish in color. The Sarpy soils differ from the Wabash and Yazoo in having loose silty or fine sandy subsoils, distinctly lighter in texture than the surface soils. This series is developed in the bottoms of the Mississippi and Missouri Rivers and their larger tributaries. The material is alluvial in origin. Owing to their low position these soils are subject to overflow, although the nature of the soil and subsoil is such that between the flood stages of the streams drainage is good to excessive. In general, the topography is flat. The Sarpy sand, fine sandy loam, very fine sandy loam, silt loam, silty clay loam, and clay are recognized in Mississippi County.

SARPY SAND.

The Sarpy sand is known as "mixed land," and consists of Sarpy sand with included areas of Sharkey clay and Sarpy soils of various textures. In most places the deep sand predominates, the Sharkey clay and other soils occurring in such small areas and so intricately mixed with the sand that separation into individual types is impracticable.

The Sarpy sand in its typical development consists of a light-brown or brown, slightly loamy sand, which becomes looser in the lower part of the 3-foot section, being often mottled in the lower part with gray or drab. Included areas consist of sand showing little change within a depth of 3 feet. Also there are included patches in which bluish-drab clay mottled with rusty brown is encountered in the lower subsoil. The greater part of the soil in the depressions is Sharkey clay, consisting of dark bluish drab silty clay which may extend to a depth of 3 feet with but little change in color or texture, although usually mottled with rusty brown. The sand of the soil represents chiefly sand blows, though some of it has been deposited uniformly over the surface of heavier soil by the wind.

The largest single area of the Sarpy sand lies southeast of Gosnell. Here it occurs as a long, narrow, irregularly shaped area in-

cluded by a bend in Pemiscot Bayou. Without doubt this particular area was formed when the bayou overflowed its banks and the water deposited large quantities of sand over Sharkey clay, Sharkey silty clay loam, and probably over some Sarpy and Yazoo soils. Other, small typical areas of this soil are along Pemiscot Bayou, a fairly large body lying west of Dell. In section 22, T. 12 N., R. 11 E., there is an area of Sarpy sand without the included areas of Sharkey clay. This consists almost wholly of pure yellowish-brown sand to a depth of several feet, with a fairly uniform surface, though hummocky in a few places.

The Sarpy sand is not extensively developed in Mississippi County. It is devoted almost wholly to cotton and corn, and both crops do well except on the areas of deepest sand. In these places crops suffer from lack of moisture. The included areas of Sharkey clay produce well, as do also those sandy spots that are underlain with clay. However, the average producing capacity of the soil is lowered to a considerable degree by its high percentage of sand. Uncleared areas support a growth of honey locust, cypress, gum, maple, elm, hackberry, and ash, with some hickory and oak.

SARPY FINE SANDY LOAM.

The Sarpy fine sandy loam typically consists of a brownish loamy fine sand to fine sandy loam. The subsoil, usually beginning at about 10 inches, is a brown fine sandy loam, which becomes heavier with increased depth until at about 30 inches it usually passes into sandy clay.

This type varies in different localities. In the vicinity of Tomato and on Island No. 25 small areas of Sarpy fine sand are included with this type. The material here consists of a light-brown fine sand, containing grains of yellowish, reddish-black, and white color. The subsoil is a medium sand, loose and incoherent in structure. In places in sec. 15, T. 10 N., R. 9 E., the soil varies from the typical; it is nearly black in color and contains enough silt to have the appearance of a loam. These areas are small. Most of this type occurs on the river side of the levees along the immediate banks of the Mississippi River and on the upper ends or heads of islands.

In the vicinity of Tomato, $1\frac{1}{2}$ miles south of Barfield, the topography is characterized by mounds and hummocks. In these places this soil is of very recent deposition. The sand is several feet in depth in places. The areas near Joiner, Shawnee, and Frenchmans Bayou occur as narrow, elongated strips, following the sloughs and bayous.

The Sarpy fine sandy loam as found on Island No. 25 and Tow Head Island illustrates the assorting power of currents of different

velocities. On these islands this soil occupies their upper ends, while the heavier soils are located below, farther down stream, the coarser material having been deposited first and the finer particles carried in suspension and deposited later.

Much of the soil is subject to overflow and therefore is undergoing constant change. Very little of it is in cultivation. A fairly large area of this type in the vicinity of Shawnee is protected from overflow by the levee. This area is rather irregular, being cut by sloughs and areas of other soils. However, it is practically all in cultivation and produces good crops.

Where cultivated, this type produces good yields of melons, potatoes, and vegetables. It is well suited to corn, alfalfa, and cotton. It is well drained, fertile, and easily cultivated.

SARPY VERY FINE SANDY LOAM.

The typical soil of the Sarpy very fine sandy loam is a brown very fine sandy loam to loamy very fine sand, which passes at an average depth of about 10 or 12 inches into a lighter brown very fine sand to loamy fine sand, or first into very fine sandy loam and below this into grayish-brown very fine sand. In places strata of heavier material, even clay, are encountered in the subsoil.

Considered as a whole, the soil is fairly uniform, but there are places where the texture ranges so close to fine sandy loam on one side or to silt loam on the other side that boundaries are difficult to establish. There are included spots of silt loam, fine sand, and fine sandy loam. Along the west bank of Frenchmans Bayou for a distance of about 3 mile north of the town of Frenchmans Bayou some areas are mapped as this type which are somewhat similar to the Yazoo very fine sandy loam. In these places the subsoil is a light sandy clay and has a typical Yazoo color.

The Sarpy very fine sandy loam is one of the most extensive soils of the Sarpy series. It occupies slightly elevated positions, occurring as natural levees along the waterways. Some large typical areas of this soil are found south of Pecan Point, along the edge of the Mississippi River from north of Tomlinson Store almost to Morgans Point, along the levee from Sans Souci to Luxora, and in a long, narrow strip along the Mississippi River bank northward from Hickman to the State line. Large areas are found on Islands No. 25 and No. 34. Smaller, less important areas occur along Pemiscot Bayou. Practically the entire city of Blytheville is situated on this type of soil.

The type has excellent drainage, owing to its slightly elevated position and open subsoil structure. At the present time most of the type is well improved and is planted mostly to cotton, corn, and alfalfa. Where proper methods are employed approximately 1 bale of cotton, 50 bushels of corn, and 3½ tons of alfalfa hay per acre

are produced. While used principally for cotton, this soil is well suited to watermelons, cantaloupes, peanuts, and potatoes, and to cabbage, beans, and many other vegetables. Cowpeas, clover, sorghum, and oats do well. A very small acreage, however, is devoted to the minor crops.

The soil is deep and loose; it warms up early in the spring, and thus insures the maturity of truck crops for a fairly early market. Practically all the Sarpy very fine sandy loam is in cultivation, and it ranks among the best soils of the county. It usually occurs in the vicinity of bodies of water, which fact may have some connection with its drought-resistant qualities.

This land in the vicinity of Luxora, Osceola, and Nodena is held at \$100 to \$125 an acre.

The results of mechanical analyses of samples of the soil and subsoil of this type are given in the following table:

Mechanical analyses of Sarpy very fine sandy loam.

Number.	Description.	Fine gravel.	Coarse sand.	Medium sand.	Fine sand.	Very fine sand.	Silt.	Clay.
		<i>Per cent.</i>						
460825.....	Soil.....	0.0	0.2	0.2	0.8	36.4	57.5	5.0
460826.....	Subsoil.....	.0	.0	.2	14.0	57.5	24.2	3.8

SARPY SILT LOAM.

The soil of the Sarpy silt loam in its typical development consists of a brown, mellow silt loam, which passes at about 10 to 14 inches into light-brown or yellowish-brown very fine sandy loam, this in turn grading usually into yellowish-brown very fine sand or loamy very fine sand, faintly mottled with shades of yellowish and rusty brown, especially in the lower, poorly drained positions. In places there is a subsurface layer of brownish silty clay, usually faintly mottled with rusty brown and dark drab. The subsoil in some areas consists of a uniformly light-brown very fine sandy loam, which extends to a depth of 3 feet or more. Thin layers of silty clay loam and clay frequently alternate with the sandy subsoil material. In a few places along the Mississippi River from Sans Souci Landing to the head of Island No. 34 some small areas which have a sandy clay to clay subsoil are mapped as Sarpy silt loam.

The Sarpy silt loam is about equal in importance to the Sarpy very fine sandy loam. Both are important in the eastern part of the county.

This type occurs in long strips running in a general north and south direction and approximately paralleling the Mississippi River. The areas range from about 100 yards to about 3 miles in width, the

largest developments occurring along the river and usually near the main channel. The largest typical areas are located south from Luxora to Island No. 34, and at Hickman. Smaller areas occur along the banks of the Mississippi River and small streams and bayous.

This type occupies a slightly higher position than the heavier members of the Sarpy series. It occurs as parts of the natural levees along the banks of the river. Because of its higher position it has good surface drainage, and the loose, open nature of its subsoil insures good internal drainage. It is one of the richest soils along the river and because of its fertility and good location and drainage is a very important type. It is well suited to the production of cotton, clover, corn, and alfalfa.

During the course of the survey a few fields of cotton were seen on this land where the growth seemed to go almost wholly to weed and very few bolls were produced. These areas, however, were invariably in lower spots where the moisture content was excessive. In general, the type seems to be better adapted to the production of corn and alfalfa than to cotton. The soil is well suited to melons, strawberries, and vegetables, though very little of it is used for such crops.

Practically all of the Sarpy silt loam is cleared and in cultivation. In the vicinity of Osceola it is valued at \$100 an acre, with little of it for sale at that price.

Areas of the Sarpy silt loam are designated on the map by sand-spot symbols where sand blows or mounds of sand are prominent. This variation of the type occupies relatively small areas in Mississippi County, its total area probably not exceeding 1,000 acres.

About $1\frac{1}{2}$ miles north of Burdette there is a slight ridge running about $2\frac{1}{2}$ miles in an east and west direction. This is known as Sandy Ridge, and is occupied by soil of this character and the Yazoo very fine sandy loam. Another area in sections 11 and 12 northeast of Blytheville is a typical development of the sand-blow variation of the Sarpy silt loam. Smaller areas are located one-fourth mile east of Gosnell, on the south side of Pemiscot Bayou, in section 7, T. 15 N., R. 11 E., one-half mile southeast of Hickman, in section 17, T. 15 N., R. 13 E., and 2 miles north and northwest of Nodena. When the unproductive sand blows are numerous the yields are reduced. However, the soil is well drained between the sand mounds and produces good crops of corn and cotton. It should prove well suited to melons and vegetables.

SARPY SILTY CLAY LOAM.

The Sarpy silty clay loam consists of a dark-brown, faintly mottled with gray or drab, heavy silt loam to silty clay, which passes either into lighter brown very fine sandy loam and this into yellowish-brown loamy very fine sand to very fine sand, or first into mottled

brown and rusty-brown silty clay and then into the sandy material. The lower subsoil often shows mottlings with shades of brown.

The subsoil is usually encountered at about 8 to 10 inches. In many places it consists of yellowish-brown very fine sandy loam streaked and mottled with shades of brown. Often the very fine sandy loam grades into a fine sand to loamy fine sand of a yellowish-brown color. Some areas have layers of mottled silty clay alternating with layers of sandy material in the subsoil. In other areas, too small to separate, the deep subsoil consists of sticky, plastic clay, of a mottled drab and rusty-brown color. In a large number of patches throughout this type the subsoil consists of yellowish-brown medium to coarse sand. In such places the soil is less fertile and less retentive of moisture than the typical.

The Sarpy silty clay loam is typically developed all along the Mississippi River, its largest bodies generally lying about $1\frac{1}{2}$ miles from the main channel. Large areas are located between Rosa and Wilson.

The topography of the larger areas is level to flat. The areas occupying the banks of streams are slightly elevated. The type often occurs as long, narrow ridges. This ridge topography is typically developed in T. 10 N., R. 9 E.

As a whole this is a valuable type. It is productive, well improved, and generally occupies favorable situations. Most of it is cleared and in cultivation, and it is used largely for cotton, corn, and alfalfa. It is well suited to many other crops, such as oats, clover, cowpeas, and vegetables. Before being cleared the typical Sarpy silty clay loam supported a growth of pecan, cane, walnut, gum, cottonwood, elm, sycamore, and oak.

Within the Sarpy silty clay loam there are a number of areas of soil differing from the typical only in the presence at a depth of 20 to 30 inches of a sticky, plastic silty clay mottled with drab and rusty brown, identical with the subsoil of the Sharkey clay. In a few localities in this variation the soil is a clay rather than a silty clay loam, and in others sand blows are present in very small areas. The areas with the heavy subsoil have a level surface and are similar in position to the typical Sarpy silty clay loam. The largest single area of this variation lies between Holt and the levee, extending southward to Upper Nodena and Tomlinson Store. Other areas, small in size, are scattered over the county. The material was deposited as alluvium from the Mississippi River. It consists of sand spread over Sharkey clay and later covered with a layer of finer sediment consisting of silt or clay particles. All of this soil is in cultivation, and while probably not so well drained as the typical Sarpy silty clay loam it is successfully used for the same crops, mainly cotton and corn.

Sand-spot symbols are employed on the map to show areas where sand mounds or "blows" are numerous. These sand patches include sand to fine sand, sandy loam, fine sandy loam, and loam underlain at shallow depths by orange or yellowish-brown sand, loamy sand, fine sand, loamy fine sand, loam, or heavier material. The color of the heavier material varies from yellowish brown to gray or bluish drab. This heavier material in places grades below into lighter material. The soil between the sand blows is the typical Sarpy silty clay loam. Near the line of contact with the mounds, where there is frequently more or less sandy material in the surface soil, the material varies in texture and structure.

The sand-blow variation is fairly extensive on this soil in this county. Part of the town of Luxora is located on one area, which extends westward from that place for a distance of $1\frac{1}{2}$ miles, and another occurs in secs. 24 and 25, T. 13 N., R. 10 E. Smaller areas occur along Pemiscot Bayou, in the northeastern corner of sec. 8, T. 14 N., R. 12 E., at Etowah, and in other places.

Less than one-half the total area of this kind of soil is in cultivation, but where cleared it produces good yields of corn and cotton, though the yields per acre are lower than on the typical Sarpy silty clay loam, because of the usually poor returns from the sand spots.

Sarpy silty clay loam, poorly drained phase.—The Sarpy silty clay loam, poorly drained phase, occurs in relatively low situations, where the type between the slightly higher sand blows is more poorly drained and more mottled in the subsoil than the corresponding higher, better drained typical soil.

The soil consists of brown, dark-brown, or black silty clay loam, underlain at about 1 inch to 3 inches by mottled brown, rusty-brown, and gray or drab silty clay loam, which in turn is underlain at about 4 to 6 inches by a brown to mottled brown and drab very fine sandy loam to very fine sand. This subsoil grades below into lighter colored very fine sandy loam or very fine sandy clay to very fine sand of mottled grayish and yellowish color. Often the lower subsoil consists of a yellowish-brown, rather compact silty clay mottled with drab or gray.

Where the included sandy patches or sand blows are numerous, they are shown on the map by sand-spot symbol. They exist as conspicuous hummocks of rounded to irregular outline, or as slight, flattish elevations, only a few inches above the intervening silty clay loam. The surface material is quite variable, including sandy loam, loam, fine sandy loam, or very fine sandy loam of a brownish color. It is underlain at a depth of a few inches generally by yellowish-brown very fine sand to fine sand, which in turn grades into yellowish-brown to mottled yellowish-brown, drab, or gray silty clay, silty clay loam, very fine sandy clay, or sandy clay.

Typical areas of the poorly drained phase of the Sarpy silty clay loam occur at Archillion Station, in sections 17, 18, 19, and 30, T. 13 N., R. 10 E., east and west of Yarbrow, and northeast of Blytheville. The phase is not extensively developed in this county.

Only a very small part of this phase is cleared. The land is low and marshy. It is forested with willow, locust, and cypress, but includes "openings" in which the only growth consists of grass and flags. It is not so valuable a soil agriculturally as the typical Sarpy silty clay loam. It will probably prove valuable, however, with proper improvement, including artificial drainage.

SARPY CLAY.

The typical surface soil of the Sarpy clay consists of a brown silty clay faintly mottled with rusty brown, the lower part often being mottled brown, rusty brown, and drab. The drab color becomes predominant with increased depth. At about 12 to 24 inches a brownish very fine sandy loam or silty loam is reached, and in some places very fine sand is found. A mottled silty clay loam or silty clay is encountered below or interstratified with the lighter textured subsoil material in places within the 3-foot section. Occasionally the lighter textured subsoil material is reached within about 6 inches of the surface. There is frequently a surface layer of silty loam or silty clay loam not more than an inch or so in thickness.

The Sarpy clay is not an extensive soil in Mississippi County, occurring in small scattered bodies. The largest areas are found between Luxora and Wilson and from Rosa north to the Missouri State line.

This type in its typical location occupies flat or depressed areas which lie usually at the edge of the Sharkey soils. It is not a poorly drained soil, but is made more productive by artificial drainage. The soil is sticky when wet. It is considered a good corn soil and produces 50 to 75 bushels per acre. There are several fields of alfalfa on this type, and this legume makes a luxuriant growth. Cotton is grown extensively and produces on an average about three-fourths to 1 bale per acre. Grass, wheat, oats, and clover do well.

A large portion of the Sarpy clay is cultivated. Only a few small areas of this type remain forested. The original growth consisted of cottonwood, sycamore, and gum, with some walnut and pecan. In the more poorly drained places cypress is found.

The typical Sarpy clay is in places spotted with flattish sand patches or mounds. The sand blows usually consist of sand, sandy loam, loam, and clay of brownish color, underlain at a few inches by a brownish to orange or grayish fine, medium, or coarse sand. Usually drab, plastic, sticky clay mottled with rusty brown is encountered within the 3-foot section. This land is not extensive or

important in this county. The largest areas occur irregularly along Pemiscot Bayou, near Athelstan, west and south of Barfield, along Crooked Lake Bayou, one-half mile west of Driver, and northeast of Wilson. The sand-spotted areas occupy a slightly higher position than the typical Sarpy clay, and have a somewhat hummocky topography. They are used for the same crops as the main type, but the yields average lower, owing to the low producing power of the sand.

Sarpy clay, poorly drained phase.—The soil of the poorly drained phase of the Sarpy clay consists of a brown silty clay mottled with drab and rusty brown, the drab becoming more conspicuous with increase in depth. The subsoil, beginning at variable depths, consists of lighter textured material, such as very fine sandy loam, loamy very fine sand, fine sand, loamy fine sand, fine sandy clay, and material of other textures, of a brownish color mottled with rusty brown and drab.

The surface soil of this phase is about the same as that of the Sharkey clay, but since the Sharkey soil typically does not pass into sandy material within the 3-foot section, while the Sarpy does, it is deemed advisable to classify this soil with the latter series.

This soil occurs in low, poorly drained situations, many of which appear to be the bottoms of old stream channels or bayous. It is not extensive. Areas are scattered irregularly over the county.

This poorly drained land is mainly forested. The natural vegetation consists of sweet gum, sycamore, maple, willow, black gum, ash, hackberry, and cypress.

YAZOO SERIES.

The Yazoo soils are brown to light brown to a depth of 6 to 10 inches. The subsurface to a depth ranging from 6 to 18 inches is gray or pale yellowish in color and friable to floury in structure. Beneath the gray layer lies a moderately to highly plastic clay or silty clay layer, from 6 inches to a foot in thickness. Beneath the heavy layer lies the parent river alluvium like that from which the overlying soil horizons have been developed. These soils occur in the Mississippi alluvial belt, being developed on recent or ancient natural levees.

YAZOO VERY FINE SANDY LOAM.

The Yazoo very fine sandy loam is a brown very fine sandy loam, underlain at about 6 to 8 inches by a dark-brown silty clay loam which passes abruptly at about 15 to 20 inches into a yellowish-brown or yellow, compact, plastic clay, showing faint mottlings of gray in places. In some places the subsoil is a dark-gray or black very fine sandy loam to a depth of 18 inches or more where it becomes slightly

sandy in texture and friable in structure. Such places represent an approach toward the Sarpy very fine sandy loam. In other places the subsoil consists of a friable, light-colored clay loam often mottled with gray and drab and containing iron and lime concretions.

The type is not extensive in Mississippi County. It occurs in small areas characteristically as long, narrow, slight ridges or swells along the edges of depressions containing Sharkey clay. The largest typical area of this soil extends in a northwesterly direction from Clear Lake. The highest portion of Sandy Ridge is a narrow strip of this soil running in an east and west direction. Other areas are found one-half mile west of Tomato, south of Chickasawba, and west and southwest of Yarbro.

The Yazoo very fine sandy loam produces good crops of cotton and corn. In places it is somewhat droughty. It is well adapted to the production of sweet and Irish potatoes. Yields of about 200 bushels per acre of the latter are obtained. Corn does fairly well. Vegetables should do well on this soil.

Included with the Yazoo very fine sandy loam are a few small areas in which the material differs only in being relatively coarser in texture, being really a fine sandy loam. This variation occurs mainly in the northern part of the county in the vicinity of Blytheville. Some of the bodies occur as faint ridges within areas of the typical Yazoo very fine sandy loam, and usually along old slough or bayou channels, now nearly filled with Sharkey clay or some of its modified occurrences. Occasionally, however, it occurs in level areas. Most of it is in cultivation and under existing methods of agriculture it has essentially the same value as the typical soil.

YAZOO SILT LOAM.

The Yazoo silt loam, to a depth of about 6 inches, is a light-brown to brown or grayish-brown silt loam of friable to floury structure. A gray subsurface layer is well developed, consisting of silty clay loam with brown iron stains. At 15 to 20 inches a heavy clay layer is abruptly encountered. This extends to about 24 to 30 inches. It is tough and plastic in structure and mottled dark drab and brown or gray and brown in color. The underlying material is more friable, more silty in texture, and has a mottled yellow and gray color.

The largest areas of this type are found in the northern part of the county in the vicinity of Yarbro, New Hope Church, Blytheville, St. James Church, and Archillion, and, in the southern part, near Bassett. Smaller areas are scattered irregularly over the county.

Most of the type is in cultivation, corn and cotton being the main crops produced. These crops do fairly well.

In sections 26 and 35, T. 15 N., R. 11 E., and in the vicinity of Clear Lake, are spots where the surface soil is a black to very dark brown silt loam underlain by a thin layer of sand or fine sand, passing into yellow, plastic, waxy clay, which is often mottled with drab. In some areas the silt loam soil is underlain by gray clay faintly mottled with yellow or black and extending to a depth of 3 feet or more. Near Yarbrow there are a few areas of this latter description.

Sand mounds occur in this type. Where they cover approximately 15 per cent or more of the surface, symbols are shown on the map. The material of the sandy spots consists of loose, yellowish-brown, medium to coarse sand, which in places extends to a depth of 3 feet or more, and in other places is underlain by black silt loam to clay. They occur in large, scattered bodies along Pemiscot Bayou and around Blytheville. Practically all of them are in cultivation. They are devoted to cotton, corn, oats, alfalfa, potatoes, and vegetables. A few small orchards have been set out recently. The sandy patches are not capable of producing so good yields as the typical Yazoo silt loam. Where not cleared these areas support a growth of pecan, holly, sweet gum, oak, walnut, persimmon, and sycamore.

In the following table the results of mechanical analyses of samples of the soil and subsoil of the typical Yazoo silt loam are given:

Mechanical analyses of Yazoo silt loam.

Number.	Description.	Fine gravel.	Coarse sand.	Medium sand.	Fine sand.	Very fine sand.	Silt.	Clay.
		<i>Per cent.</i>						
460835.....	Soil.....	0.1	0.6	0.4	4.0	22.6	55.2	17.4
480836.....	Subsoil.....	.2	.4	.4	1.2	2.1	56.4	39.2

YAZOO SILTY CLAY LOAM.

The Yazoo silty clay loam is a brown to dark-brown silty clay, underlain at about 10 to 12 inches by yellow or pale-yellow, tough clay, which does not show much change in the 3-foot section, except that the lower part is sticky or tough and waxy. Some patches of light-yellowish clay, apparently eroded spots, are included, as are other spots where sand appears in the subsoil. These are less productive than the typical soil.

The Yazoo silty clay loam is largely confined to the vicinity of Blytheville and Archillion. It has good surface drainage, except locally, and supports in the uncleared areas a growth of cane, oak, pecan, and sycamore. About half of the type is cultivated, and good crops of cotton and corn are produced. Owing to its heavy, plastic structure in places this soil is difficult to work and to keep in good tilth, being inclined to clod.

There are included spots of a grayish color, resembling the Waverly silty clay loam. In such spots the subsoil consists of a yellowish silty clay to clay, and is often mottled with gray and drab, in places being almost wholly gray in color.

Most of the area is covered with sand-spot symbols on the map.

The sand often extends to a depth of 3 feet, and is usually light brown at the surface, becoming lighter in color and coarser in texture with increased depth. Some included areas consist of fine sand to very fine sand, underlain at about 20 inches by a heavy layer of drab clay. The largest single area having the sand spots extends irregularly from Sandy Ridge nearly to Blytheville, a distance of over 5 miles. Smaller areas are found north of St. James Church and near Clear Lake.

Much of this land is now in cultivation, being devoted principally to cotton. Corn, oats, alfalfa, potatoes, and other general farm crops are also grown.

Where forested this type supports a growth of ash, cottonwood, sycamore, hackberry, maple, and gum, the ash predominating.

YAZOO CLAY.

The Yazoo clay is a brown to rather dark brown clay which has a waxy structure a few inches below the surface. At about 18 to 20 inches a lighter brown to yellowish-brown, tough clay is reached, which is mottled in the lower part of the 3-foot section with shades of yellow and drab and contains some whitish particles. A few included patches are of a whitish color, resembling the Waverly clay.

The type occupies areas slightly higher than the typical Sharkey clay, but lies at about the same elevation as the Sharkey clay, better drained phase. In some localities it is very difficult to distinguish between these two series. The topography of the Yazoo clay is variable, consisting of slight elevations and depressions as well as level areas.

This is an unimportant soil in Mississippi County because of its small extent. The Yazoo clay is typically developed around the southern end of Clear Lake, near Rosa along Mill Bayou, in sections 28 and 33 of T. 14 N., R. 12 E., and $2\frac{1}{2}$ miles northeast of Burdette Junction.

Only small areas are in cultivation, and only fair yields are obtained. Cotton and corn are the principal crops grown. In many places this type is used for pasture land, as it supports a heavy growth of cane, which affords excellent forage for cattle.

The sand-spotted areas of the Yazoo clay occur only in small bodies, mainly in the vicinity of St. James Church. Cotton and corn are grown but produce lower yields than those obtained on the typical Yazoo clay.

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

Mechanical analyses of Yazoo clay.

Number.	Description.	Fine gravel.	Coarse sand.	Medium sand.	Fine sand.	Very fine sand.	Silt.	Clay.
		<i>Per cent.</i>						
460837.....	Soil.....	0.3	1.8	1.9	6.6	9.5	49.6	30.1
460838.....	Subsoil.....	.0	.3	.3	.7	23.2	41.0	34.5

WABASH SERIES.

The Wabash soils are prevailing black, ranging to dark brown, and contain a high percentage of organic matter. The subsoils are drab or gray. These soils are developed in the first bottoms of streams in the Central Prairie States. They extend for long distances along the Mississippi River. The material is derived mainly from the calcareous drift material and loessial deposits of the Mississippi Basin. The series is represented in this county by a single type, the Wabash clay.

WABASH CLAY.

The surface soil of the Wabash clay is a dark-drab to black clay, usually mottled below the surface with rusty brown and containing some iron concretions. The subsoil differs but little from the soil, being a black, sticky, plastic clay, conspicuously mottled with shades of brown. Often in the lower subsoil the iron concretions are so numerous as to make boring difficult. In places this lower layer consists largely of ferruginous material or bog-iron ore.

The Wabash clay occurs wholly in the northwestern part of the county. It is typically developed along Buffalo Creek and Honey

Cypress Swamp, and distributaries of these. These streams are shallow, sluggish waterways without well-defined channels, but they carry much water, mainly from Missouri drainage ditches. Their banks are low and a considerable area of land is overflowed along their courses, from the State line to their discharge into Right Hand Chute. In this part of the county numerous sand blows occur, and from these large quantities of sand are being deposited in places on this type.

The type is of small extent and of no agricultural importance at present, but with drainage it will produce excellent crops, especially of corn. The natural vegetation is dense. It consists mainly of hackberry, sycamore, locust, maple, ash, gum, cypress, and willows, with flags, water lilies, swamp grass, and other plants.

LINTONIA SERIES.

The surface soils of the Lintonia series are light brown or yellowish brown in color and have a silty texture. The subsoils have a slightly lighter color and a somewhat more compact structure. The series occupies stream terraces and flat alluvial lands along streams, through which the channels are so deeply cut that overflows are of rare occurrence. In places narrow strips of colluvial material occur, usually adjoining terraces or bottom lands. The material of this series is mainly alluvial, and is derived from the Memphis, Richland, and Knox soils. Drainage is well established. In Mississippi County the Lintonia series includes four types, the sandy loam, fine sandy loam, silt loam, and silty clay loam.

LINTONIA SANDY LOAM.

The typical Lintonia sandy loam consists of light-brown loamy sand to sandy loam, underlain at about 10 to 12 inches by dark-brown to light-brown sandy clay, which generally has the same color and texture throughout the 3-foot section. Occasional sand blows are present over the type.

This is the most extensive of the Lintonia soils. It is found in fairly large areas as terraces, as slight ridges, and in level situations, which in places are interrupted by the depressions of sloughs and shallow depressions of Calhoun soils. As a whole the type is fairly well drained. It lies above normal overflow.

The largest areas of this type lie 1 mile east of Boynton between Honey Cypress Swamp and Buffalo Creek, and in sections 5 and 6, T. 14 N., R. 8 E.

But little of the Lintonia sandy loam is in cultivation. It is used for corn and cotton. It is loose and generally not so productive as the heavier soils of this series. The high level of the water table

seems to prevent crops from suffering during periods of dry weather. Most of the type is in forest, which consists of oak, walnut, sycamore, elm, persimmon, ash, cottonwood, and sweet gum.

The results of mechanical analyses of samples of the soil and subsoil of this type are given in the following table:

Mechanical analyses of Lintonia sandy loam.

Number.	Description.	Fine gravel.	Coarse sand.	Medium sand.	Fine sand.	Very fine sand.	Silt.	Clay.
		<i>Per cent.</i>						
460813.....	Soil.....	0.1	4.4	17.8	48.7	9.8	12.8	6.3
460814.....	Subsoil.....	.1	3.0	10.9	30.6	14.0	26.5	14.8

LINTONIA FINE SANDY LOAM.

The Lintonia fine sandy loam is a brown fine sandy loam, underlain at about 8 to 10 inches by light-brown or yellowish-brown fine sandy loam to fine sandy clay, with some faint mottling of gray in the lower subsoil. Some sand blows occur, and these consist of yellowish-brown, brown, and grayish coarse sand, underlain either by dark-brownish to black silt loam to silty clay loam or by sand extending to a depth of 3 feet. The soil of forested areas is somewhat darker colored than that in fields.

This type occurs as narrow, elongated, scattered areas, extending in a north and south direction. It occupies slightly elevated swells on the terraces and is typically developed where these low ridges occur between or along the edges of sloughs of Honey Cypress Swamp and Buffalo Creek.

In some areas of the Lintonia fine sandy loam only occasional sand blows appear. Such areas are much more productive than the main type.

Less than one-half of the type is farmed, the remainder being in timber. A large part of it consists of cut-over land. This soil is capable of producing fair to good yields of cotton, corn, oats, and alfalfa.

LINTONIA SILT LOAM.

The Lintonia silt loam is the most important soil of the river terraces of Mississippi County. It is a brown, mellow silt loam which passes at about 8 to 10 inches into yellowish-brown silt loam, and this in turn into silty clay loam or silty clay. The lower subsoil is often faintly mottled with shades of brown. Sand blows are scattered irregularly over the type.

This type occurs on the stream terraces in the northwestern part of the county. It has a level to somewhat billowy surface, and is locally known as "second bottoms." It occupies elongated areas

which extend in a north and south direction, averaging three-fourths mile in width and several miles in length. A large typical body of this soil extends from Cottonwood Point south for 8 miles. This strip grades into the Sharkey clay along Right Hand Chute. Another large area extends from Boynton southward about 9 miles, though interrupted by other types in places.

This is the best agricultural soil of the terraces. It has good drainage and occupies a position above normal overflow, although portions of it have been inundated.

The value of this soil is materially lowered by the presence of many sand blows, but good crops are produced. It is especially suited to the growing of cotton, corn, wheat, oats, cowpeas, and grasses. With good management cotton yields 1 bale; corn, 40 to 60 bushels; oats, 40 bushels; and cowpea hay, 1½ tons per acre. Fruits and vegetables should do well on this soil.

While the greater part of the type is cleared, there is still quite a large area in ash, gum, pecan, walnut, and oak.

This land sells for \$50 to \$75 an acre, and with improvements is held for \$100 an acre.

Within the Lintonia silt loam there are a number of areas of very fine sandy loam, which in all features other than texture are typical. They, like the typical areas of the silt loam, are interspersed with sand blows. The largest areas of this variation extend southward from Leachville in narrow, elongated strips. Other developments occur southwest and southeast of Manila and in a strip extending northeastward from Hills Store.

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

Mechanical analyses of Lintonia silt loam.

Number.	Description.	Fine gravel.	Coarse sand.	Medium sand.	Fine sand.	Very fine sand.	Silt.	Clay.
		<i>Per cent.</i>						
460815.....	Soil.....	0.0	0.2	2.2	9.0	10.4	68.0	9.8
460816.....	Subsoil.....	.0	.1	1.0	5.9	30.0	50.7	12.2

LINTONIA SILTY CLAY LOAM.

The Lintonia silty clay loam consists of brown silty clay loam, underlain at about 6 to 10 inches by lighter brown silty clay loam to clay, mottled somewhat with shades of brown, gray, and drab. There are included areas of Calhoun silt loam and silty clay loam too small to map. In many places this type closely resembles the Calhoun silty clay loam, but owing to its prevailing brown color in both soil and subsoil it is classed with the Lintonia series.

Sand blows are abundant on this type. They consist of variable material, ranging in texture from coarse to very fine sand.

The Lintonia silty clay loam occupies, in most cases, that part of the terrace which joins the first bottom, and in many places it occurs on the gradual slopes. It is not particularly well drained and portions of it are subject to overflow.

The largest bodies of this soil occur in the vicinity of Manila, where it grades into the first-bottom soils along Right Hand Chute.

Only small areas of the type are in cultivation, most of it being covered with a natural growth of sycamore, walnut, hickory, cottonwood, gum, oak, and cypress.

In the higher, better drained areas good crops of cotton and corn are grown, but as a whole crops do not produce so well as on the Lintonia silt loam.

The results of mechanical analyses of samples of the soil and subsoil of this type are given in the following table:

Mechanical analyses of Lintonia silty clay loam

Number.	Description.	Fine gravel.	Coarse sand.	Medium sand.	Fine sand.	Very fine sand.	Silt.	Clay.
		<i>Per cent.</i>						
460852.....	Soil.....	0.0	0.4	4.0	31.6	4.0	37.5	22.5
460853.....	Subsoil.....	.0	.5	4.2	29.9	5.6	36.6	23.4

CALHOUN SERIES.

The soils of the Calhoun series are of gray color and heavy texture. The heavy clay subsoils are gray or drab, and have a tenacious, waxy structure. Iron concretions are common, and in places there is a substratum of sandy material. These soils occupy poorly drained, flat stream terraces, where water stands on the surface for long periods after rains. They are not subject to overflow. The material is of alluvial origin. Two members of the Calhoun series, the sandy loam and silt loam, are recognized in Mississippi County.

CALHOUN SANDY LOAM.

The soil of the Calhoun sandy loam consists of pale-yellowish to grayish loamy sand to sandy loam, underlain at about 18 to 24 inches by lighter colored or grayish to drab sandy clay. There is also some slight mottling of brown. There are spots where the subsoil is near the surface, and others where the sand is more than 3 feet deep. A number of bodies show brown mottlings and carry iron concretions in the subsoil. Such areas resemble the Olivier sandy loam.

The Calhoun sandy loam occurs west of Big Lake and the Right Hand Chute of Little River. Its largest areas are southwest of Manila, where the land is overflowed.

The Calhoun sandy loam occurs in low, wet, poorly drained depressions throughout the Lintonia terrace soils. Although the general surface is level, there are many sand mounds, which lower the value of the land.

This soil supports a forest growth of cypress, water maple, elm, water oak, some sweet gum, locust, and willow, while flags and water-loving grasses grow luxuriantly in the open areas. Owing to its very poor drainage, the type is not cultivated. It will probably be left in its present condition until all the more desirable land is cleared. Without drainage it would likely give best results with corn, although cotton, cowpeas, and other crops have been successfully grown on such land. This land can be bought for \$25 an acre.

CALHOUN SILT LOAM.

The Calhoun silt loam consists of a gray to mottled grayish and brownish silt loam, underlain at about 6 to 8 inches by gray to grayish-brown silty clay loam to silty clay, the gray color usually predominating. In some of the higher, better drained areas the surface material of included spots closely resembles the soil of the Lintonia silt loam, but the subsoil is grayish. These spots represent inclusions of Olivier silt loam. Some patches are rather sandy and in some depressions the soil is black. The lower part of the subsoil is compact and almost uniformly gray in color, and is in some areas somewhat sandy. Small areas of Lintonia silt loam and sandy loam, Calhoun sandy loam and silty clay loam, and Olivier silt loam are included. Occasional hummocks or mounds of sand are scattered throughout the type.

The Calhoun silt loam occupies low, shallow depressions or swales in the stream terraces. It is of small extent and of relatively little importance in this county. It occurs wholly in the northwestern section.

The largest areas of the type are located 2 miles northwest of Manila, north of Buckeye School, and northeast and west of Boynton.

The topography of the Calhoun silt loam varies but little. The surface is mainly level. The soil is poorly drained and occurs in narrow, elongated areas on which water stands for long periods after rains.

At present the type is not cultivated. When cleared and drained it should produce corn, oats, and grasses successfully. The type supports a forest growth of elm, ash, sycamore, and hackberry, and a dense growth of underbrush. Most of the timber has been cut over.

Some of the areas mapped as Calhoun silt loam are heavier than a silt loam, and are, in fact, a silty clay loam in texture. They are

small, and for this reason are mapped with the silt loam. They are typical of the series and are like the silt loam in all respects except texture. The largest of such areas lie one-half mile north of Buckeye School, $1\frac{1}{2}$ miles northwest of Manila, one-half mile south of Springfield, and in sections 24 and 25, T. 14 N., R. 8 E., and sections 19 and 30, T. 14 N., R. 9 E. These areas are slightly less well drained than the typical soil, occurring as depressions which in the early spring are covered with water. At present they are not cultivated.

In the following table the average results of mechanical analyses of samples of the soil and subsoil of the typical Calhoun silt loam are given:

Mechanical analyses of Calhoun silt loam.

Number.	Description.	Fine gravel.	Coarse sand.	Medium sand.	Fine sand.	Very fine sand.	Silt.	Clay.
		<i>Per cent.</i>						
460821, 460854.....	Soil.....	0.1	0.2	1.0	12.4	21.1	51.5	13.5
460822, 460855.....	Subsoil.....	.4	1.1	.9	8.4	21.5	44.9	22.9

MISCELLANEOUS MATERIAL.

MEADOW.

Meadow comprises areas of variable soil in low-lying positions along the Mississippi River banks, and in recently abandoned channels, where there is a mixture of soils, such as silty clay loam, very fine sandy loam, very fine sand, sand, sandy clay, and clay, so intimately associated that separation into types is impracticable. The general tendency, however, of all the Meadow mapped in this county is toward the Sarpy soils, both in color and texture.

All the Meadow occurs on the river side of the levee and is subject to frequent inundation. The largest area is found in the southern part of Island No. 25. Other areas are encountered on Tow Head Island, on the point southeast of Hickman, on the southeastern side of Island No. 34, east of Sans Souci, and along the low banks of the Mississippi River in other places.

This soil has very poor drainage, is changed annually by overflows, and supports a thick growth of cottonwood and willow. It is not in cultivation and at present is practically worthless.

The areas mapped as Meadow include some Riverwash, consisting of low areas of sandy material occurring usually as slopes from the edge of the water on the concave side of bends. This material is also subject to frequent inundation and repeated additions of deposits.

OVERWASH.

Overwash consists of grayish to yellowish-gray, loose, medium and coarse sand, underlain at about 12 to 30 inches by Sarpy clay or Sharkey clay.¹

This material was spread over the clay near the Mississippi River during the spring floods of 1912 and 1913, and is made up of river sand washed through breaks in the levee during that inundation.

Overwash has fairly good drainage, being in places slightly higher than some of the surrounding lands. The surface is almost level. This soil is confined to a few small areas near Wilson, and is not important in this county.

The crop value of this soil has not as yet been determined, though late corn planted in 1913 yielded fairly well. The productiveness of the soil largely depends upon the depth of the sand. No crops have been grown under good conditions, owing to late and unfavorable seasons since the formation of this land. Probably where the sand is not very deep corn will produce good yields. Cotton also should do well, though during the one year it was grown yields were low, owing to the poor season.

In some low areas sand was deposited to a depth of several feet, and in such places the soil is of little value. The value of some good farm land was considerably reduced by the deposition of this material.

SUMMARY.

Mississippi County is situated in northeastern Arkansas. It has an area of 899 square miles, or 575,360 acres. It is entirely within the River Flood Plains Province.

The surface configuration varies but little, being prevailingly level and flat.

The entire county was at one time heavily forested, and less than half of the land has been cleared for cultivation. Lumbering is still an important industry.

The natural drainage of the county is generally poor, owing to the low-lying position of the soils, and to the annual overflows of the Mississippi River. Drainage conditions have been improved, however, by the construction of levees and drainage ditches. Over 300 miles of artificial drainage ways have been constructed during the last 10 years.

The population of the county is reported in the 1910 census as 30,468. Blytheville, with a population of about 4,000, and Osceola,

¹ Mineralogical analyses showed the presence of the following material: Quartz, microcline, magnetite, rutile needles included in quartz; orthoclase, apatite included in quartz, muscovite (very small amount), slight amount of microscopically indeterminate carbonates, and concretions of claylike material. Quartz is the predominant mineral.

with about 2,000, are the largest towns in the county. The population is increasing rapidly.

The county has good shipping facilities, by railroads as well as by steamboats on the Mississippi River. The eastern part of the county is well supplied with wagon roads.

Cotton, corn, and alfalfa are the principal crops produced. The farms, as a rule, are large. The soils are adapted to a wide range of crops, but the prevailing system of farming is not diversified.

The soils range from loose, incoherent sands to heavy, plastic clays. They are divided into two general classes, the first-bottom soils and the second-bottom or terrace soils.

The Sharkey soils, of the first bottoms, are the most important in the county. They are poorly drained for the most part, but occur in large bodies and are strong and productive. A large part of this series is still in forest. Good yields of cotton, corn, and alfalfa are obtained on the Sharkey clay, better drained phase.

The Sarpy soils are uniformly brown in color and have sandy subsoils. They occur along the banks of the Mississippi River and other streams. The very fine sandy loam, silt loam, and silty clay loam are the most important types. Good crops of alfalfa, cotton, corn, and red clover are grown on these soils.

The Yazoo soils occur in the vicinity of Clear Lake, Archillion, and Archillion Station.

The Wabash series is represented by one type, the Wabash clay. This soil occurs in low depressions throughout the terraces of the northwestern part of the county.

The terraces or second bottoms are situated west of Big Lake in the northwestern corner of the county. They are not subject to ordinary overflow. The soils of the terraces are classed with the Lintonia and Calhoun series.

The Lintonia are the more important of the terrace soils. They are uniformly brown in color, and for the most part sandy in texture. Good crops of corn and cotton are grown on these soils.

The Calhoun soils occur in small areas, and represent low, poorly drained spots in the terraces.

Meadow and Overwash are miscellaneous soil types mapped.



[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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