Issued October 27, 1909.

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

SOIL SURVEY OF HOLMES COUNTY, MISSISSIPPI.

BY

W. J. GEIB.

[Advance Sheets—Field Operations of the Bureau of Soils, 1908.]

WASHINGTON:
GOVERNMENT PRINTING OFFICE,
1909.

[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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LETTER OF TRANSMITTAL.

U. S. DEPARTMENT OF AGRICULTURE,
BUREAU OF SOILS,
Washington, D. C., January 2, 1909.

SIR: I transmit herewith the manuscript copy of the report and map covering the soil survey of Holmes County, Miss. This project, extending the study of the soils of this State, was selected after due consideration of the requests on file in the bureau. The work was strongly recommended by Hon. B. G. Humphreys in his letter to you under date of October 16, 1907, referred to the bureau October 19, 1907.

I recommend the publication of this report as advance sheets of Field Operations of the Bureau of Soils for 1908, as authorized by law.

Very respectfully,

MILTON WHITNEY,
Chief of Bureau.

Hon. JAMES WILSON,
Secretary of Agriculture.

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MAP.

SOIL SURVEY OF HOLMES COUNTY, MISSISSIPPI.

By W. J. GEIB.

DESCRIPTION OF THE AREA.

Holmes County is situated a little northwest of the center of the State of Mississippi, and comprises an area of 524,992 acres, or about 820 square miles. It lies wholly within the Mississippi Basin, and the drainage is effected by the Yazoo and Big Black rivers. It is bounded on the north by Carroll County; on the east by the Big Black River, which divides it from Attala and Madison counties; on the south by Yazoo County; and on the west by the Yazoo River, which separates it from Washington and Leflore counties.

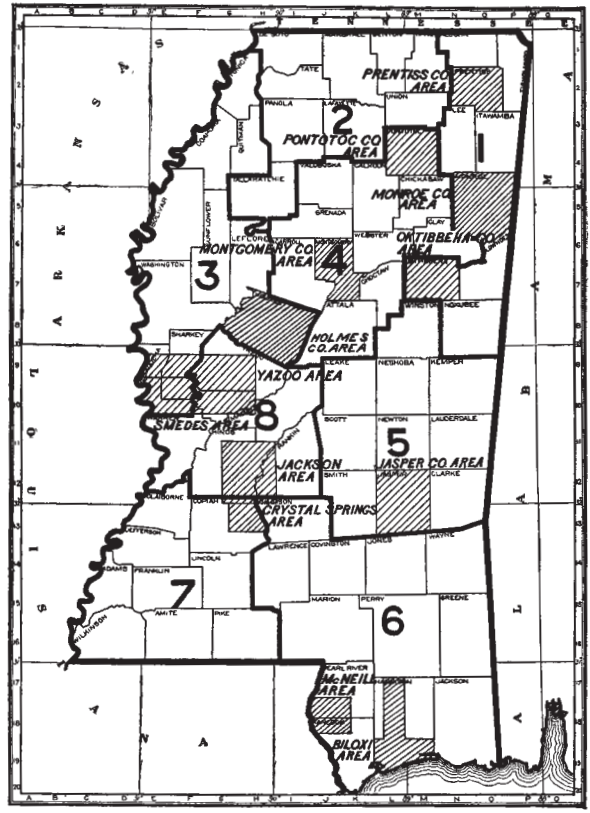

FIG. 1.—Sketch map showing location of the Holmes County area, Mississippi.

The surface of the county may be divided into two physiographic divisions, one known as the "Delta" and the other as the "Hill Section." The dividing line between these divisions consists of a line of bluffs extending from Memphis to Baton Rouge in a long, flat arc, and this escarpment forms the eastern boundary of the Mississippi Delta. The bluffs rise from 75 to 200 feet above the level of the Delta, and in many places the walls are nearly perpendicular, while in others the descent is a steep slope or a more gentle decline.

The hill section comprises the eastern two-thirds of the country and is characterized by a topography varying from rough and broken to gently rolling and nearly level. The greater part of the upland is rolling and hilly. In the vicinity of Franklin and Richland and south to the county line the surface is only gently rolling, while along Black River it is nearly level, although sloping gently toward the lowland bordering that stream. The loess covering this entire region has been badly eroded in many places, and large tracts have thus been rendered unfit for cultivation.

The eastern part of the hill section drains into the Big Black River, which forms the eastern boundary of the county, and, flowing in a southeasterly direction, empties into the Mississippi River about 20 miles below Vicksburg. The western part of this region is drained by Little Black Creek, which receives the waters from Fannegusha, Harland, and Willis creeks, and then flows into Tchula Lake, through which it connects with the Yazoo River. The divide between these two drainage systems enters the county about 7 miles northwest of West, a station on the Illinois Central Railroad. It extends south to a point 3 miles east of Bowling Green, turns southwest to within 2 miles of Franklin, whence it swings due west for about 6 miles, after which it again extends southward, leaving the county 4 miles southwest of Ebenezer.

The western one-third of the county comprises a part of the Mississippi flood plain known as the "Yazoo-Mississippi Delta." It consists of a low, flat alluvial bottom with an elevation above sea level of about 115 feet. The variation in elevation within this part of the Delta is from 10 to 20 feet. The drainage system consists of winding streams, long, narrow, crooked lakes, and numerous bayous. These lakes represent old stream channels which were abandoned by the streams when in times of high water new channels were formed. Tchula Lake, which is the longest of these, connects with the Yazoo River at Marksville, extends in a southerly direction and again joins the same stream about 15 miles below. This course forms Honey Island. The old channel curves in broad arcs and bends back upon itself, forming many large and small peninsulas. In tracing its course through all of its windings the entire length is nearly 35 miles, but in a straight line the distance is about 15 miles only. Horseshoe and Bee lakes are similar in character, although smaller in extent. Both of these connect with Tchula Lake.

The earliest permanent settlements within the present county limits were made between 1826 and 1836. The present inhabitants are nearly all descendants of settlers who came from the Carolinas, Georgia, Virginia, Kentucky, and Tennessee. A few people from more northern States have come in to engage in the lumber business or to practice general farming or trucking. In 1900 there were 8,120

whites and 28,708 negroes in the county. In the hills the races are about equally divided, but in the Delta the blacks are by far the more numerous.

Holmes County was organized February 19, 1833. It was originally part of the territory forming the large county of Hinds, ceded to the United States by the Choctaw Indians in the treaty of Doak's Stand, October 18, 1820, and was long known as the "New Purchase." One of the counties created out of Hinds was Yazoo County, from which was taken the territory forming the present county of Holmes.

The county seat is located at Lexington, near the center of the county, on a branch of the Yazoo and Mississippi Valley Railroad, which extends from Durant to Tchula. It is a prosperous town of 2,000 inhabitants, has a cotton compress, oil mill, and gin, and is the leading cotton market in the area. It has four banks, an electric-lighting plant, numerous business houses, and is well supplied with artesian water. Durant, with a population of 2,300, is located in the eastern part of the county, on the main line of the Illinois Central Railroad. It has a wagon factory, brick plant, canning factory, electric lighting plant, two banks, and numerous business houses. It also is well supplied with artesian water. Large quantities of strawberries, potatoes, and cabbages are shipped to northern markets from this point. Three miles west of Durant is Castalian Springs, which has gained a reputation because of the healthful properties of its mineral water, and has become a summer resort of considerable importance. Cruger, Tchula, Mileston, Thornton, Beelake, West, Goodman, and Pickens are small railroad towns of less importance.

The transportation facilities are excellent. The Yazoo River on the west furnishes water transportation for the part of the delta bordering that stream. The main line of the Illinois Central and a branch extending from Grenada to Jackson, by way of Greenwood, traverse the area from north to south. These lines are connected by a branch road running from Tchula to Durant. Another line extends from Durant to Aberdeen, Miss. Durant is 680 miles south of Chicago and 242 miles north of New Orleans.

Cotton is bought at all of the towns within the county and these places furnish a limited market for dairy products, vegetables, and the like. Practically all of the small fruits and vegetables shipped north are consigned to Chicago. The dirt roads throughout the county are worked by contract and are usually in fair condition. During the winter in the delta they are very bad, and it is almost impossible to travel over them. In the summer they become as hard and firm as pavement.

CLIMATE.

As the Weather Bureau has no station in Holmes County it is necessary to refer to the records from the nearest outside station, which

is located at Yazoo City, Miss. As this is but 12 miles from the south boundary line of the area, the data will apply very well to this section. The following table gives the normal monthly and annual temperature and precipitation as recorded at the Yazoo City station:

Normal monthly, seasonal, and annual temperature and precipitation.

Month.	Temperature.			Precipitation.			
	Mean.	Absolute maximum	Absolute minimum.	Mean.	Total amount for the driest year.	Total amount for the wettest year.	Snow, average depth.
	°F.	°F.	°F.	In.	In.	In.	In.
December	47	82	9	4.2	0.6	4.6	0.2
January	46	81	10	5.5	3.8	7.5	.7
February	45	82	−2	4.8	8.7	3.2	1.2
Winter	46	.....	.....	14.5	13.1	15.3	2.1
March	58	91	24	5.9	3.6	6.0	Trace.
April	66	96	33	4.2	3.5	11.2	.0
May	75	103	42	3.0	2.0	2.3	.0
Spring	66	.....	.....	13.1	9.1	19.5	Trace.
June	80	102	48	4.5	3.1	5.8	.0
July	83	107	51	4.4	.6	7.6	.0
August	83	107	52	4.4	1.7	7.4	.0
Summer	82	.....	.....	13.3	5.4	20.8	.0
September	76	105	39	2.6	.6	2.1	.0
October	65	99	24	1.8	4.5	.3	.0
November	55	88	14	2.8	2.6	4.8	.0
Fall	65	.....	.....	7.2	7.7	7.2	.0
Year	65	107	−2	48.1	35.3	62.8	2.1

The table shows a maximum temperature of 107° and a minimum of −2°, or a range of 109°. The mean annual temperature is 65°. The hottest months are July and August, while the coldest are January and February. The mean for the delta is slightly lower than in the hills, but the difference is not marked.

The rainfall for the series of years given varies from 35.3 inches to 62.8 inches, with a mean of 48.1 inches. As will be seen, it is fairly well distributed throughout the year, the least rainfall being during the cotton-picking season of September, October, and November. Rain frequently comes in torrents, causing considerable damage to the uplands by washing and erosion and to the lowlands by flooding. Late floods frequently overflow the bottoms and portions of the delta, and do considerable damage to growing crops, necessitating the replanting of cotton and corn.

The winters are mild, but the weather is very changeable. The summers are long and warm. Spring opens in March, and the season is so long that two crops can readily be grown upon the same field.

The average date of the last killing frost in the spring is March 27, and the average date of the first in the fall is November 2. The date of the latest killing frost on record is April 21, and the date of the earliest in the fall is October 21.

AGRICULTURE.

The first farms in Holmes County were cleared between 1826 and 1836, and the four earliest settlements were Rankin, Montgomery, Vernon, and Georgeville, all now extinct. Before the war large plantations were in operation in various parts of the county. These were practically self-supporting. Everything consumed at home, except a few luxuries like tea and coffee, was grown upon the plantation. Even the common wearing apparel and shoes were made at home. Cotton was the only money crop, and as there were no railroads it was necessary to haul this staple to points on the Yazoo River, from which it was shipped by boat. Some hauling was also done between this section of the State and Jackson, as railroads were constructed to that point before any reached Holmes County. Besides cotton and corn, some wheat, oats, and a little tobacco were grown, and enough beef and pork were produced to supply the domestic needs.

The farm implements and methods were very crude. In the eastern part of the county the farm operations were at first confined to the uplands because of the comparative ease with which the hills were cleared and made ready for the plow, but later the bottoms along the streams were cleared, and found to be very productive. The system of cultivating the hill land was careless and wasteful, especially upon the large plantations, where, as soon as the soil ceased to yield well, fields were abandoned and allowed to wash and gully, and new clearings were made, which in turn were abandoned after a few years of use.

In the delta section only a few plantations were in operation prior to 1850. These were located along the front lands bordering the Yazoo River and Tchula Lake. The tracts containing the sandy ridges were usually selected first, as this land was easy to cultivate and less frequently inundated than the heavy low-lying soils of the interior. The soils of the delta were more productive than the hill lands, and fields were seldom if ever abandoned as "worn out." Several of the old plantations have been growing cotton continuously for over sixty years, and still produce profitable yields.

With the coming of the railroad to this region the production of wheat and tobacco was greatly reduced and finally discontinued, and for many years, as is still the case, not enough corn and hay have been grown to supply the local demand. Cotton has been the

money crop and success in farming has depended upon this one staple.

From the civil war to within twelve or fifteen years ago the agriculture of the area was nonprogressive. There had been few improvements in the implements used, in the care of the soil, or in the growing of crops. The low price of cotton for many years discouraged a considerable number of the farmers, and some moved to what they considered more prosperous sections in other States. The agricultural practices are now in a transitory state. Cotton is still the chief money crop, and more attention is given to it than to all other crops, but the farmers are coming to realize that it is more profitable to reduce the acreage of cotton, to grow more corn, oats, and cowpeas, and to practice some definite crop rotation. Some of the farm implements still in use are crude, but great advances are being made along this line, and now the disk harrow, disk plow, two-horse turning plows, and two-horse cultivators are not uncommon.

When preparing land in cotton one year for cotton the next year, the general custom is to turn two furrows together between the old rows, and later to run a lister under the row itself, throwing the dirt into the middle of the rows and making a low ridge. This may be run over with a one-horse cultivator to improve the seed bed, or the seed may be planted without further preparation. Ordinary one-horse cotton planters are used to sow and cover the seed. The after cultivation given to the crop is not usually sufficient to regulate the moisture supply and give the best possible results.

The cotton grown is principally the short-staple varieties, though there are quite a number of planters who each year cultivate a small acreage of long-staple cotton. It is usually more profitable to grow short-staple cotton, as there is not always a market for long staple and the yields are smaller, and these factors about compensate for the higher price.

Not as much corn is grown in the area as should be, the production not equaling the local demand, and each year considerable corn is shipped in and sold to farmers throughout the county. More thorough cultivation on the present acreage would do much to meet this deficiency. Attention to the selection of seed is an important factor in successful corn growing, and care in this detail will well repay the planter. A corn club, which has been recently organized, is giving this matter attention, and marked results have already been obtained.

Oats are grown to a limited extent and may be seeded either in the spring or fall, though the fall seeding seems to give the best results. None of the grain is thrashed, the crop being cut and cured for hay. All of the oats fed to stock as grain are shipped in. There is no reason why this crop should not be more extensively grown.

Cowpeas have a greater acreage than formerly, and their use is becoming more popular each year. The most progressive planters sow cowpeas in the corn at the last cultivation. After the corn is gathered the vines are pastured or plowed under. They greatly improve the soil, and the cotton the following year plainly shows marked soil improvement. Cowpeas are also sown for hay, and the vines when cured are greatly relished by stock.

Sugar cane is grown in the creek bottoms throughout the hill portion of the county and also in the delta. The molasses brings a fair price in the local market, and practically the entire output is consumed within the area.

In the vicinity of Durant the trucking industry has been developed to considerable proportions. Strawberries, cabbage, Irish and sweet potatoes, peas, and beans are profitably grown. Strawberries are sometimes ready for the market by the middle of March, although the season may vary as much as two or three weeks. The berries are packed in crates of 24 quarts each and shipped in refrigerator cars. Cabbage is started in cold frames and transplanted to the field from the first to the middle of March. Irish potatoes are planted about the same time. The potatoes are ready for market anywhere from the first to the middle of June, and the cabbage not much later.

Practically all of the berries, cabbage, and potatoes are shipped to Chicago. In 1907, 43 carloads of strawberries, 7 cars of cabbage, and 1 car of Irish potatoes were shipped from this point. Considerable quantities go in less than car lots. Buyers come to the area to purchase strawberries; the rest of the truck is shipped to commission houses. There is a local truck growers' association formed to aid in intelligent marketing of the produce.

The season is of sufficient length so that two crops of potatoes, a crop of cabbage and a crop of potatoes, or early potatoes or cabbage followed by cotton can be grown upon the same field. The returns from these crops have been very encouraging and the trucking industry is being extended. The acreage devoted to cabbage is being greatly increased this year.

The live stock of the area is mostly of inferior grades. With cattle, Jersey blood predominates and there are some thoroughbreds.

The local meat markets are supplied with beef from home-grown cattle, and some beef cattle are shipped out each year, but these are usually small and not in prime condition, and therefore the price obtained is low. The dairy industry has not been developed to any extent, there being but one first-class dairy in the county. This industry could be profitably extended and should be encouraged. Some hogs are kept on every plantation, but they are not extensively raised, and large quantities of pork are shipped in from the large

packing houses. It would seem that hog raising could be made very profitable here.

The question of winter forage crops for this section of country is an important one and should be carefully considered by all who expect to raise stock. For the maintenance of a dairy herd or for the production of beef or pork it is desirable to have some forage crops which can be cut and fed to the stock or used as a pasture crop at any time of the year. A continuous supply of succulent feed will greatly increase the flow of milk and reduce the expense of producing beef and pork. Oats, rye, or barley, if sown in the early fall, make a good pasture for late fall and winter. Turf oats and vetch, if sown in October or November, give good pasture for two or three months during the winter. Cowpeas can be readily grown and cut and fed green or cured for hay. Alfalfa when once well established furnishes excellent pasturage and yields a large return of hay. Rape is also a crop which should be grown more in this section. It should be sown in September or October. Corn and sorghum should also be used for soiling crops, and Bermuda grass and Japan clover can be utilized for summer pasture.

The question of fertilizers is now receiving more attention than formerly, and within the last few years some of the leading planters have been trying commercial fertilizers. Their use, however, is not common. Tests of different kinds of fertilizers should be made by the farmers throughout the hill section of the country to determine the peculiar needs of the several soils. The Mississippi experiment station has done valuable work along this line, and the reader is referred to bulletins of that station for more detailed information.

In the trucking section about Durant, commercial fertilizers are used more freely than elsewhere in the county. For potatoes and cabbage the following home mixture is sometimes used: 1,300 pounds cotton-seed meal and 700 pounds of acid phosphate applied at the rate of 250 to 500 pounds per acre. Ready prepared fertilizers are also used. There seems to be a doubt among some of the growers as to the benefit of commercial fertilizers for strawberries, but as remarkable results have been obtained in other places by using fertilizers, it would seem that their judicious use here would also be profitable. The use of nitrate of soda at the rate of 200 pounds per acre, applied preferably at intervals during the growing season, should greatly increase the yield. Where stable manure is used it has been found advisable to supplement it with wood ashes or muriate of potash.

No systematic crop rotation is practiced in the area and comparatively little attention is given to the adaptability of the various soils to particular crops. Some fields have produced cotton for over sixty years. A systematic crop rotation, together with proper culti-

vation, would not only increase the productivity of the soil, but it would materially lessen the damage done by washing. If cotton and corn are to be grown as the main crops, a 2-year rotation with these alternating can be profitably followed, provided catch crops be grown. At the last cultivation of corn, for instance, cowpeas should be sown and a winter cover crop to be pastured or turned under may be sown later. This will greatly increase the productiveness of the soil. A 4-year rotation may be had by adding oats one year and then allowing the field to grow up to grass one year. Oats should be sown in the fall and plowing for the corn crop should also be done in the fall or winter. The soil should be plowed to a depth of 7 to 9 inches and very thoroughly pulverized before the seed is planted.

Holmes County is distinctly divided into two cotton regions. In the upland country the farms are smaller than in the delta and more generally cultivated by their owners. The cotton from this section is all shipped by rail. In the uplands a single gin usually handles the crop of an entire community, while in the delta nearly all of the large plantations have gins of their own, and along the Yazoo River the cotton is shipped by boat.

The county has an area of 524,992 acres. The census of 1900 states that there are 359,859 acres in farms, of which 203,480 acres are improved. The size of landholdings in the area at present ranges from 20 to 5,000 acres. The average size of farms as given by the last census is 69.9 acres, but this is too small, as each tenancy was tabulated as a farm. The average individual holding is probably several times as great.

The large plantations are divided into small tracts, or "cuts," which are all under the supervision of a manager, but are farmed by colored tenants. Two systems of renting are practised. Under the share system the landowner furnishes everything except the labor, and gets half the crop. The owner has the first lien on the crop, and the merchant who supplies provisions has a second lien. The tenant may secure good returns for his labor or he may find himself in debt at the end of the season, according as the crop flourishes and as the prices rule high or low. In case a tenant has stock and tools of his own he may pay cash rent or give a stipulated quantity of cotton as rent. In the delta the rent varies from $4 to $9 an acre or from 50 to 80 pounds of lint cotton per acre. In the hills the rent is somewhat lower.

Day labor is somewhat more difficult to obtain than tenant labor, as much of the floating labor usually prefers to work in sawmills or on the railroad where wages are higher. The daily wage on the plantations varies from 50 cents to $1. No difficulty has been experienced in securing help to pick strawberries, women and children

being employed. Two cents a quart is the usual price for picking berries.

Land values vary greatly in different parts of the country. In the vicinity of Durant, where trucking has been developed, some farms have been sold as high as $150 an acre. The farms throughout the uplands range from $5 to $40 an acre with an average of $15 or $20 an acre. In the delta for a good plantation about half under cultivation and well located $35 an acre is considered an average price. Large tracts in the open swamp may be bought for $8 to $15 an acre, depending upon the value of the timber. The plantations on the railroad, which are nearly all cleared, are often valued as high as $50 or $60 an acre.

Throughout the delta artesian water can be readily secured at a depth of from 750 to 900 feet, and throughout the hills it can be obtained at a depth of 900 to 1,100 feet.

Taking a general view of the agriculture of the country, too much dependence is placed on a single crop, cotton; too little attention is paid to the production of hay, corn, oats, and such other products as must be fed on the farms. The system of cultivation practiced at the present time tends to " wear out " the soil rather than to build it up, and the number of live stock is far below what it should be. The dairy industry and the production of pork should be extended, and more attention should be given to the growing of forage crops. Truck growing can be profitably developed along the railroad lines. A systematic crop rotation should be followed, deeper plowing and more frequent after cultivation should be practiced, and an attempt should be made to incorporate more organic matter in the soil.

SOILS.

Practically all of the State of Mississippi lies within that physiographic division of the United States known as the " Gulf Coastal Plain." The entire region was at one time occupied by an extension of the Gulf of Mexico. As the floor of this extension rose above the level of the sea, the various agencies at work produced marked differences in the surface features of the new land. The accumulation of vast deposits of marine shells give rise to the Selma chalk formation, from which the soil of the " black prairies " is derived. The deposition of materials stained with iron which were washed into the retreating gulf from the north and east gave rise to the Lafayette formation, from which are derived the soils of the oak and pine hills and pine flats regions. The very fine particles carried to this region, either by wind or water, or perhaps both, and deposited as a narrow band extending across the State from north to south, makes up what is called loess, forming the bluffs or " cane hills." The por-

tion of the State which has been worked over and deposited by the Mississippi River and its tributaries is known as the Delta.

Three of the formations above referred to are represented in Holmes County, and each gives rise to soils having peculiar characteristics by which they can be readily recognized.

The oldest geological formation represented within the area is the Lignitic stage of the Eocene. This forms the floor upon which the later formations have been deposited. It consists of drab and bluish clays and frequently contains beds of lignite. These Eocene clays come to the surface in Holmes County only in a few places, where the overlying materials have been eroded, and as they do not influence the soils in any way, they need not be further considered.

Over the eastern two-thirds of the area the Eocene clays are covered to a depth of 4 to 20 feet by the Lafayette. This formation consists of red, yellow, and pinkish sands, clays, and gravel, and occurs very extensively throughout the Atlantic and Gulf coastal plains. From it are derived the Orangeburg and Norfolk series of soils. It is exposed in the present survey only along the foot of the bluffs, where it gives rise to the Norfolk gravelly loam, and in the eastern part of the area, where it forms the Orangeburg fine sandy loam. This latter type occupies the hillsides from which the loess has been eroded.

Directly over the Lafayette formation occurs the loess, which originally covered the entire surface of the area east of the bluffs to a depth of 4 to 30 feet. Erosion, however, has carried away much of this material until the underlying formation is now exposed in numerous places. The loess gives rise to two soil types, the Memphis silt loam and the Richmond silt loam.

The western one-third of the area is covered to a depth of 4 to 15 feet by alluvium, which has been deposited, reworked, and redeposited by the Mississippi River and its tributaries. This material is similar to that found throughout the flood plain of the great river and its branches.

The manner in which this important agricultural district was formed presents an interesting study. At one time the region was covered by an extension of the Gulf. Later the floor of this body of water gradually rose above the level of the sea. Rivers from the north brought down sediment and deposited it throughout the nearly level region at times of high water. Each successive overflow added new material, raising the land higher and higher above the mean level of the streams. This process has continued for centuries and is still going on. The result has been a wide area of nearly level land of great and inexhaustible productiveness.

The various soil types which have been recognized in the delta were deposited in standing or moving water, the speed of the current

being the determining factor in the texture of the resulting soil. When the river overflowed its banks in times of floods there was a checking of the current as the water passed over the river banks. As the rate of the current was reduced the heaviest and coarsest particles held in suspension were deposited. These large particles accumulated from one flood to another until a low ridge was built up along the stream channel. Upon this ridge is found the Yazoo fine sandy loam, which represents the coarsest particles carried to this region by the stream currents. As the flood waters spread out over the country adjacent to the river the current was still further reduced, and as a result finer particles were deposited. These finer grains gave rise to a finer and heavier soil, which has been called Yazoo loam. The flood waters, after breaking over the banks and spreading over the adjacent lowlands, finally come to rest in the large interstream areas. While in a quiet state the finest particles held in suspension were deposited, and from this material has resulted the Wabash clay and the Sharkey clay.

Where the delta borders the bluffs there has been a wash from the high land to the low, the fine particles of loess accumulating near the foot of the bluffs, giving rise to two soil types—the Lintonia loam and the Waverly silt loam. A similar condition exists along the streams throughout the upland, but here only the Lintonia loam is found

Immediately at the foot of the bluffs, just below the loess, the Lafayette formation is frequently exposed. As the sand, gravel, and clay of this formation are gradually worked down by the elements, the type Norfolk gravelly loam is formed. The particles composing this soil are coarser and heavier than those of the loess, and consequently they are not carried any distance from the bluffs.

The Meadow areas are low, flat stretches along the streams of the upland, where the soil material has been much mixed in process of formation. The Meadow is subject to overflow and frequently remains in a swampy condition for the greater part of the year.

The following table gives the total area and relative extent of each type mapped:

Areas of different soils.

Soil.	Acres.	Per cent.	Soil.	Acres.	Per cent.
Memphis silt loam	220,288	42.0	Waverly silt loam	8,512	1.6
Sharkey clay	102,080	19.5	Yazoo fine sandy loam	5,888	1.1
Richland silt loam	61,824	11.8	Orangeburg fine sandy loam	4,800	.9
Yazoo loam	31,488	6.0	Norfolk gravelly loam	1,792	.3
Lintonia loam	30,016	5.7	Total	524,992	
Meadow	29,760	5.7			
Wabash clay	28,544	5.4			

YAZOO FINE SANDY LOAM.

The surface soil of the Yazoo fine sandy loam consists of a brown or light-brown fine sandy loam extending to a depth of 8 to 12 inches. The material is very uniform and consists almost entirely of very fine sand and silt, the two in the sample analyzed amounting to over 90 per cent. The silt content increases along the boundary of the heavier types, and here the soil has a loamy character. The subsoil consists of a compact brown fine sandy loam grading into a heavy loam at a depth of 16 to 24 inches, at which depth a clay loam of bluish color is often encountered. Along the highest part of some of the sandy ridges and along some of the streams the soil consists of a light fine sandy loam, underlain by a fine sand. This phase, however, is of small extent and was therefore not mapped as a separate type.

On account of the sandy nature of the soil, this type is more easily cultivated than any other in the delta and as a consequence is usually preferred.

The Yazoo fine sandy loam is confined to the delta and occurs chiefly as long, low, narrow ridges along the streams and old stream channels. The highest ridges along the streams seldom rise more than 8 or 12 feet above the general level of the delta. They form the front lands and slope gently toward the large inter-stream areas, as well as toward the streams along which they occur. In going down the incline into the interior, the soil grades from the fine sandy loam through a loam into a heavy waxy clay. Going toward the stream the fine sandy loam often extends to the water's edge, though there is frequently a narrow strip of loam or clay intervening.

Owing to the elevation and the sandy nature of the type the natural drainage is good, and, moreover, while a large part of the delta is submerged each year by floods, this type is never completely flooded, and only in times of the most general inundation is any part of it covered with water.

The Yazoo fine sandy loam is of alluvial origin. In times of floods the coarser particles held in suspension were deposited close to the margin of the streams, while the fine particles did not settle to the bottom until the current became less strong or until the stream came to rest in the low flat areas. These coarser particles—they are really comparatively fine—are the material forming this type of soil. The individual particles consist of quartz sand and mica, with a mixture of silt and clay.

Practically all of the type is under cultivation. Some of it has been tilled for over seventy years and most of the old plantations consisted partly of this type. From its earliest settlement cotton has been the chief crop, although some corn and cowpeas are grown. No fertilizers

of any kind are applied and the yields have gradually decreased. Cotton yields from one-quarter to three-quarters bale per acre, with an average of one-third bale. Corn averages about 20 bushels per acre.

This type is adapted to a variety of crops and could easily be made to produce much larger yields by rotating crops and fertilizing. Cotton should be greatly reduced in acreage, and more corn, oats, and cowpeas produced. Alfalfa could also be grown successfully, and near the railroad early truck crops could be grown with profit. Cabbage, potatoes, strawberries, and tomatoes will do well and give good returns.

Farms of this type of soil range in value from $10 to $40 an acre, depending upon the location and improvements.

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

Mechanical analyses of Yazoo fine sandy loam.

Number.	Description.	Fine gravel.	Coarse sand.	Medium sand.	Fine sand.	Very fine sand.	Silt.	Clay.
		Per cent.	*Per cent.*	*Per cent.*	*Per cent.*	*Per cent.*	*Per cent.*	*Per cent.*
18407	Soil	0.0	0.4	0.4	1.9	45.1	46.1	5.7
18408	Subsoil	.0	.1	.3	2.0	41.4	45.0	12.0

YAZOO LOAM.

The soil of the Yazoo loam consists of a fine, brown or nearly black heavy loam extending to a depth of 6 to 10 inches. The smooth feel, which is quite characteristic of the type, is due to the presence of a high percentage of silt. When the moisture conditions are favorable, the soil is easily cultivated and works into a mellow seed bed. When wet it becomes quite sticky. The subsoil consists of a drab or sometimes a mottled clay loam or clay which frequently becomes waxy. This extends to a depth of more than 36 inches.

The Yazoo loam is confined entirely to the delta and is always found near streams or old stream channels. It usually occurs as long bands varying in width from one-eighth to three-quarters of a mile, although a few irregular areas were mapped. The largest occurrences are found along Tchula Lake, Horsehoe Lake, and Bee Lake. These are old stream channels. The areas of this type of soil along the Yazoo River are not nearly as extensive as along the old stream channels.

As a type the Yazoo loam is a gradation from the fine sandy loam of the low ridges along the streams to the heavy clays of the interior. The surface has a very gentle slope toward the large interstream

areas, and this results in fair drainage, the conditions being much better than in the case of the heavy clay soils, but not as good as with the Yazoo fine sandy loam.

The lower portions of the type are subject to overflow, but the surface water runs off as soon as the floods subside. With the installment of tile drains and more open ditches this soil will be greatly improved.

The Yazoo loam is an alluvial soil laid down by moving water, the current of which had been retarded to a greater extent than when the sandy ridges were formed.

The greater proportion of this type is under cultivation at the present time. It is considered the best all around soil in the delta, yet while it is a good general farming soil, cotton and corn are the only crops grown to any extent. Cowpeas are sometimes sown in the cornfields after the last cultivation, but this practice is not as common as it should be. No systematic crop rotation is practiced. The type is well adapted to grass, and on the higher, well-drained parts alfalfa will grow vigorously. Oats would also do well, and this crop should be grown more extensively. More cowpeas should be grown, and commercial fertilizers, which are not used at all at present, could be applied to great advantage. Commercial fertilizers, consisting chiefly of potash and phosphoric acid, should be used.

The methods of cultivation are similar to those in vogue throughout the delta. The land is plowed with a turning plow and later bedded with a lister. Frequently the turning plow is dispensed with. Level cultivation is followed to some extent, though this practice is not common, on account of the excess of moisture in the ground in the spring. Level cultivation is preferable when the drainage will permit.

The average yield of cotton is one-half bale, although 1 bale is often secured. Thirty-five bushels of corn is considered an average crop. Farms of this type of soil range in value from $15 to $50 an acre, depending upon the location and improvements.

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

Mechanical analyses of Yazoo loam.

Number.	Description.	Fine gravel.	Coarse sand.	Medium sand.	Fine sand.	Very fine sand.	Silt.	Clay.
		Per cent.	*Per cent.*	*Per cent.*	*Per cent.*	*Per cent.*	*Per cent.*	*Per cent.*
18411, 18413.....	Soil	2.1	3 8	1.4	3.2	9.7	56.9	23.1
18412.....	Subsoil.....	1.1	3.9	1.3	2.7	9.5	65.3	16 5

WABASH CLAY.

The soil of the Wabash clay consists of 6 to 8 inches of black or dark-brown heavy clay loam. This is underlain by a drab or bluish waxy clay extending to a depth of more than 36 inches. The surface soil is stiff and waxy when wet. On drying the soil particles are drawn closer together, forming large and small compact masses and cracking the surface. The cracks are frequently 1½ inches wide and over 1 foot deep, and if close together the soil sometimes crumbles so as to present a pebbly or sandy appearance. On account of the color and size of some of these clay masses the term "buckshot land" is used in describing this soil.

Cultivation of the Wabash clay is difficult. If plowed when the moisture conditions are favorable, the soil becomes quite loose and friable during after cultivation. If plowed when too dry, large clods result and these are very difficult to pulverize, while if plowed too wet the heavy clay sinks back into the furrow in a compact mass and on drying becomes very hard and solid.

The Wabash clay is confined to the delta portion of the county and usually borders the front lands. It lies between the Yazoo loam and the Sharkey clay. The largest area lies directly west of Horseshoe Lake. Many smaller areas are found bordering the front lands along the Yazoo River and Tchula and Bee lakes. The surface is level with only here and there slight irregularities due to erosion caused by stream currents cutting across from one drainage system to another in times of unusually high water.

On account of the even topography and the low surface, the natural drainage is poor. Some open ditches have been constructed with satisfactory results. These are preferable to tile drains, since the soil is so compact that many drains would be required and the cost of construction would be greater than the value of the land warrants.

The origin of the Wabash clay is the same as that of the Sharkey clay, both these soils having been laid down in quiet water which had overflowed the banks of the river in times of floods and come to rest in the large interstream areas.

About half of this soil is under cultivation at present and under favorable conditions good crops are produced. It is naturally a very strong soil, and if the proper drainage systems were established its value would be greatly enhanced. Cotton yields from one-half to 1 bale per acre and corn from 20 to 40 bushels per acre.

No fertilizers are used on this soil and no systematic crop rotation is practiced. The acreage devoted to cotton should be reduced and more corn and grass should be grown. Cowpeas should also be introduced into the rotation.

Farms of this type of soil range in value from $10 to $25 an acre.

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

Mechanical analyses of Wabash clay.

Number.	Description.	Fine gravel.	Coarse sand.	Medium sand.	Fine sand.	Very fine sand.	Silt.	Clay.
		Per cent.	*Per cent.*	*Per cent.*	*Per cent.*	*Per cent.*	*Per cent.*	*Per cent.*
18403	Soil	0.7	1.9	0.7	1.7	8.9	66.4	19.4
18404	Subsoil	1.1	3.6	1.3	3.0	12.6	57.4	20.2

SHARKEY CLAY.

The surface soil of the Sharkey clay consists of a stiff brown clay extending to a depth of 6 inches. The subsoil, to a depth of 36 inches or more, consists of a stiff, waxy, impervious clay of a drab or mottled color. When dry and exposed to the sun the surface cracks badly and on account of the small masses which are formed it is locally known as "buckshot land." On account of its close compact nature and its poorly drained condition it is very difficult to cultivate.

This type occupies about three-quarters of the delta portion of the county, and next to the Memphis silt loam it is the most extensive soil in the county. The largest body is found on Honey Island, which island is formed by the Yazoo River and Tchula Lake. Another extensive area lies north of Tchula between the lake and the bluffs.

The surface is level, with only a few irregularities caused by erosion and deposition in time of floods when currents cut from one drainage system to another. The type is lower than any of the other soils of the county—but little above the level of the water in the streams. On account of this and its level surface and compact nature the drainage is very poor.

The Sharkey clay is alluvial in origin, having been deposited by the quiet flood waters which came to rest in the large catchment basins of the interstream areas. The soil represents the finest particles held in suspension by the water. These particles were gathered from the upland regions of Mississippi and States farther north, carried into the larger streams by the floods, and then deposited upon these large flood plains as soon as the water came to rest.

Only a comparatively small amount of this soil is under cultivation, but enough has been done with it to demonstrate the fact that it is a very strong soil and will produce well when drained and properly cultivated. The greater part of the type is still in timber and the forests are open and comparatively free from undergrowth. Palmetto is frequently seen along the border of the wooded areas, but this growth does not extend into the forest. The forest growth con-

sists of white oak, overcup oak, red oak, water oak, and gum, with cypress in the sloughs and swamps. The value of the timber lands is still low, but the future timber supply of the State lies chiefly within the forests of the delta region.

The development of this particular soil is a question which should be seriously considered both by the individual and by the State. There are thousands of acres in this and other counties of the delta which, when once properly drained, will be capable of producing large and profitable crops. Large, open ditches with numerous laterals would greatly assist in carrying off the excess water. This is the method followed in the Louisiana cane fields. Diking and pumping could doubtless be used successfully here, though it would require the expenditure of a large amount of money. The entire soil is not overflowed each year, but to protect against the highest floods it would be necessary to construct a system of levees along all the main and minor streams.

Cotton is the only crop grown to any extent. It yields from one-third bale to 1 bale per acre.

This soil ranges in value from $5 to $20 an acre, depending upon the value of the timber and the location.

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

Mechanical analyses of Sharkey clay.

Number.	Description.	Fine gravel.	Coarse sand.	Medium sand.	Fine sand.	Very fine sand.	Silt.	Clay.
		Per cent.	*Per cent.*	*Per cent.*	*Per cent.*	*Per cent.*	*Per cent.*	*Per cent.*
18397	Soil	0.0	2.0	1.6	4.0	5.9	44.2	42.3
18398	Subsoil	.3	.8	.5	1 6	8.1	37.9	50.6

MEMPHIS SILT LOAM.

The Memphis silt loam is the most extensive soil type in the area. The surface soil ranges in depth from 6 to 10 inches, with an average of about 8 inches. On many of the steeper slopes the soil has been eroded entirely away, while at the base of these slopes the depth is greater than the average. In color the surface material varies from light brown to a yellowish brown and in all areas the texture is uniformly a silt loam. When wet the soil is somewhat sticky, but when dry it is powdery and has the appearance of flour. The subsoil to a depth of 3 feet or more consists of a brown or chocolate-brown silt loam more compact than the surface soil, containing also a higher percentage of clay. There is no sharp demarcation between soil and subsoil. No difficulty is experienced in cultivating this type, but

a good mellow seed bed is readily secured with a minimum amount of tillage.

Owing to the composition of this type its field behavior is rather peculiar. Where deep cultivation is followed and there is a comparatively large percentage of organic matter present, the soil is friable and absorbs and retains moisture very well. If shallow cultivation is followed, as is most often the case, the soil packs and puddles during heavy rains and the water runs off instead of being taken up by the soil. The heavy rains carry away large quantities of the surface soil and cut deep ravines and gullies in the slopes. The walls of these washed places as a rule are nearly vertical and vary in height from 3 to 40 feet. The peculiar structure of the material enables them to stand for years while the gullies are being cut deeper by each successive rainfall.

The Memphis silt loam occupies the greater part of the upland section of the county. It is broken only by the strips of lowland along the streams, the outcropping of the underlying Lafayette formation on some of the slopes, and the areas of Richland silt loam which occur chiefly in the southeastern corner of the county.

In topography the land is rolling, broken, and hilly. It consists of a series of irregular ridges and cross ridges the slopes of which are often steep and very much dissected by ravines and gullies. Each rain extends these gullies deeper into the soil and farther up the slopes. The more gentle slopes are also subject to erosion, and when gullies once start in an open field it is very difficult and often impossible to prevent the destruction of the land. These eroded places give a very ragged appearance to the landscape.

The material from which the Memphis silt loam is derived consists of a mantle of loess, varying in depth from 4 to 40 feet. The depth is greatest along the bluffs bordering the delta, the material becoming gradually thinner as the eastern side of the county is approached. The formation consists of unconsolidated yellow silt, and the weathering of the exposed surface material gives rise to the type under consideration. On some of the steep slopes in the eastern part of the county the loess has been entirely removed and the underlying Lafayette formation is exposed. Here the material is a red sandy clay, in many cases covered with a layer of fine sandy loam, which gives rise to the Orangeburg fine sandy loam.

On account of the irregularities of the surface the natural drainage is good. There are a few places about the heads of streams and in small depressions where the drainage is, or has been, deficient and here the subsoil is of a drab or grayish color and small iron concretions are often present.

The original timber growth consisted of a mixture of pine, post oak, red oak, hickory, poplar, beech, and some dogwood. Most of

the merchantable timber has been cut. The predominating species are now shortleaf pine and scrub oak.

The Memphis silt loam is a safe soil for all general farm crops of this region, and on the more gentle slopes truck crops could be grown successfully. At the present time cotton and corn are the only crops produced to any extent. Yields of cotton range from one-fifth to three-quarters bale per acre, with an average of one-third bale. Corn yields from 8 to 20 bushels with an average of 12 bushels per acre. Oats do very well and are fed in the sheaf, though this crop is not grown extensively. Sweet potatoes, grown only in garden patches, yield at the rate of 100 to 200 bushels per acre. Cowpeas make an excellent stand but are not grown to as great an extent as they should be. Japan clover and Bermuda grass do well and are excellent for hay and pasture. No definite crop rotation is practiced. By following a systematic rotation and intensive cultivation all these yields could be greatly increased.

The methods of culture followed on this soil are similar to those in vogue throughout this section of country. Shallow spring plowing—from 2 to 4 inches—is practiced and ridge cultivation is universal. Cotton and corn are planted on the same field year after year until the land is completely "worn out," when the field is allowed to remain idle for a few years or sometimes abandoned. As a consequence washes start and the land soon becomes badly gullied, so that it is of no further use for cultivated crops.

To improve the physical condition of this soil and in order to secure the best results deep fall or winter plowing should be practiced. The land should be plowed to a depth of 6 to 9 inches and the soil turned up exposed to the pulverizing action of freezing and thawing and the winter rains. In the spring the field should be thoroughly gone over with a disk harrow. Experiments have demonstrated that ridge cultivation is not necessary on the uplands. Instead of planting corn and cotton on the same field year after year a definite crop rotation should be followed. Oats may be sown in the fall and as soon as the crop is harvested cowpeas should be sown. In the fall the cowpeas can be cut for hay and the ground deeply plowed. The next spring, after thoroughly preparing the field, cotton should be planted without bedding the ground. After picking the cotton, the field should again be deeply plowed and left exposed to the elements for the winter. In the spring corn should be planted without bedding and at the last cultivation cowpeas should be sown in the corn. The following year the field may be allowed to grow up to grass and used as a pasture. By following this rotation, or one similar to it, the productiveness of the soil will be greatly increased and the land will not be as apt to wash as under the present system. Green manuring

should be practiced to assist in building up the soils in need of organic matter. Where stable manure can be obtained it will be found very beneficial in increasing the productivity of the soil.

The steep slopes which are still in forest should be allowed to remain so. Many of the slopes now cleared should never have been cleared, as it is only a matter of a few years until they will become badly gullied and unfit for cultivated crops. An effort should be made to check the erosion wherever this is possible. By throwing brush in the gullies and allowing the fields to reforest, the washing will be checked. On the fields where erosion has not begun it may be prevented by following a system of cultivation which will incorporate a large amount of organic matter in the soil, deepen the surface soil, and make it capable of taking up and retaining a larger part of the rainfall. Contour cultivation will also assist in preventing erosion.

Farms of the Memphis silt loam range in value from $5 to $25 per acre, depending upon their location and the amount of damage done to the land by erosion.

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

Mechanical analyses of Memphis silt loam.

Number.	Description.	Fine gravel.	Coarse sand.	Medium sand.	Fine sand.	Very fine sand.	Silt.	Clay.
		Per cent.	*Per cent.*	*Per cent.*	*Per cent.*	*Per cent.*	*Per cent.*	*Per cent.*
18387	Soil	0.0	0.4	0.7	3.0	2.4	83.6	9.1
18388	Subsoil	.0	.1	.2	.7	5.0	70.9	22.3

RICHLAND SILT LOAM.

The surface soil of the Richland silt loam to an average depth of 12 inches consists of a brown or light-brown silt loam. The subsoil is a chocolate-brown silt loam more compact than the surface and containing a higher percentage of clay. The soil is comparatively easy to cultivate and a mellow seed bed can be readily secured.

The Richland silt loam is confined to the hill section of the county. The largest area is found in the southeastern corner of the county, extending south from Franklin, Ebenezer, and Richland to the county line. Other areas occur along Big Black River, Fannegusha Creek, and some of the other streams.

In topography this soil varies from nearly level to gently rolling. The natural drainage is good, except in depressions and over the areas that are nearly level. In these places tile drains would increase

the producing power of the soil by carrying away the excess water and by regulating the moisture supply.

In derivation the Richland silt loam is identical with the Memphis silt loam, except that the loess under the Richland silt loam is usually deeper than it is under the Memphis silt loam. There is, however, a marked difference in topography which results in a difference in agricultural value. The soil of the Richland silt loam is deeper and as a rule contains more organic matter than the Memphis silt loam, and is not so badly eroded.

While this type is not nearly so much eroded as the Memphis silt loam, many of the fields are badly washed. Even on land that is nearly level some fields have been abandoned because they have washed so that cultivation can not be continued.

Over the greater part of the Richland silt loam cotton and corn are grown extensively. The methods of cultivation are identical with those described under the head "Memphis silt loam." Because of its smoother topography and slightly better yields, this soil is usually preferred to the Memphis silt loam. Cotton yields from one-quarter to 1 bale per acre, with an average of one-half bale. Corn yields from 10 to 30 bushels, with an average of about 15 bushels per acre.

In the vicinity of Durant the trucking industry has been considerably developed upon this soil and the acreage in these crops is being extended each year. Strawberries, cabbage, and Irish potatoes, in the order named, are receiving the most attention at the present time. Sweet potatoes, peas, beans, and other garden crops are being grown to a limited extent. Plums, peaches, and pears have been tried, and there are several small orchards on this type at the present time, but the pear trees blight badly and late frosts often damage or entirely destroy the crop, and all things considered the outlook for the development of the fruit industry is not especially bright.

Over the part of the type devoted to general farming it is recommended that a systematic crop rotation similar to the one suggested for the Memphis silt loam be followed, and that experiments be tried on a small scale to determine the value of a more extensive use of commercial fertilizers. Deeper plowing and level cultivation should also be practiced. An effort should be made to reclaim the fields which are not too badly eroded and where erosion has not yet begun the greatest care should be exercised to prevent it.

Where trucking is carried on, this soil ranges in value from $30 to $150 an acre. Over the remainder of the type the value ranges from $15 to $25 an acre.

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

Mechanical analyses of Richland silt loam.

Number.	Description.	Fine gravel.	Coarse sand.	Medium sand.	Fine sand.	Very fine sand.	Silt.	Clay.
		Per cent.	*Per cent.*	*Per cent.*	*Per cent.*	*Per cent.*	*Per cent.*	*Per cent.*
18393	Soil	0.0	0.3	0.2	1.2	4.0	86.3	7.8
18394	Subsoil	.0	.1	.3	1.0	5.4	70.2	23.1

ORANGEBURG FINE SANDY LOAM.

The surface soil of the Orangeburg fine sandy loam consists of a brownish-gray fine sandy loam extending to a depth of 8 inches. The subsoil, to a depth of 36 inches, is a red sandy clay, the sand content, however, being very variable.

This soil is derived from the Lafayette formation, which is exposed on some of the steeper slopes in the eastern part of the county, where the covering of loess is at most relatively thin. The natural drainage is good, but the slopes are so steep that the soil is rather difficult to cultivate. The soil washes badly and should never have been cleared. Where cultivated, the yields are small. The value of such land is very low.

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

Mechanical analyses of Orangeburg fine sandy loam.

Number.	Description.	Fine gravel.	Coarse sand.	Medium sand.	Fine sand.	Very fine sand.	Silt.	Clay.
		Per cent.	*Per cent.*	*Per cent.*	*Per cent.*	*Per cent.*	*Per cent.*	*Per cent.*
18391	Soil	0.0	0.4	4.6	54.2	6.5	30.1	3.5
18392	Subsoil	.0	.2	7.9	53.0	6.0	7.9	25.5

LINTONIA LOAM.

The surface soil of the Lintonia loam is a brown silt loam extending to a depth of 10 or 14 inches, with an average depth of 12 inches. In local areas the soil contains a high percentage of fine and very fine sand which imparts to it the characteristics of a fine sandy loam. The subsoil consists of a yellowish or brownish silt loam which when dry or nearly so has the feel and appearance of finely ground meal and flour. The subsoil frequently contains lenses of fine sand and in places a small quantity of sand is found throughout the entire soil section.

The Lintonia loam occurs both in the delta and throughout the hill section of the county. In the delta it is found along the foot of the bluffs usually as a narrow band, though in one instance it

reaches a width of almost 2 miles. In the upland section it occurs along nearly all of the streams as a bottom soil. In origin it is both colluvial and alluvial. The wash from the slopes adjoining the streams has been mixed with the material carried down by the streams in times of heavy rains. In the delta the soil is almost entirely colluvial. The presence of sand is due to the fact that in many cases the material from the Lafayette formation has been washed down and mixed with the loess.

The surface of the type is nearly level, with merely a gentle slope toward the stream along which the soil is found. In the delta the slope is from the foot of the bluffs toward the delta proper. Owing to this gentle slope and the layer of sand which is frequently found in the subsoil, the natural drainage is good, considering the fact that much of the type occurs as a bottom soil along the streams. In the delta where the largest unbroken areas occur, and where the surface is nearly level, tile drains would greatly improve the drainage conditions. This type in the delta is never overflowed, but along the streams in the upland it is sometimes flooded for a short time after heavy rains. In the upland part of the type a ditch should be dug at the foot of each hill, so as to carry off the seepage water and rain wash from the higher ground.

Cotton, corn, sorghum, and sugar cane are grown upon this soil, and it is well adapted to these crops. Oats, Irish potatoes, and grass also do well. Cotton averages about one-half bale and corn from 15 to 40 bushels per acre, with an average of 20 bushels.

Shallow plowing and ridge cultivation are practiced upon this type, and cotton and corn are grown upon the same fields year after year, as is the case on the other soils of the area. Rotation of crops should be practiced, and cowpeas should be grown more extensively to keep up the fertility of the soil.

Farms of this type of soil range in value from $15 to $50 an acre.

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

Mechanical analyses of Lintonia loam.

Number.	Description.	Fine gravel.	Coarse sand.	Medium sand.	Fine sand.	Very fine sand.	Silt.	Clay.
		Per cent.	*Per cent.*	*Per cent.*	*Per cent.*	*Per cent.*	*Per cent.*	*Per cent.*
18381, 18383	Soil	0.0	0.0	0.1	0.8	2.0	86.8	10.8
18382, 18384	Subsoil.....	.0	.1	.2	1.3	4.7	81.2	12.0

WAVERLY SILT LOAM.

The Waverly silt loam consists of 8 inches of yellowish-drab silt loam, resting on drab or bluish silt loam somewhat heavier than the soil and extending to a depth of 36 inches or more.

The type is confined to the delta and near the foot of the bluffs. It is derived from the wash from the loess, which is carried down by heavy rains and spread out at the foot of the hills. It has the same origin as the Lintonia loam, but differs from that type in that it is low-lying, poorly drained, and as yet little developed. Only a few fields have been cleared, and it is not likely that much of the type will be put under cultivation until better drainage is established. The greater part of it is subject to overflow and parts of it are in the condition of swamp.

The Waverly silt loam has a very low agricultural value at the present time, but when cleared and well drained it will be capable of producing large yields of all the crops commonly grown in the area.

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

Mechanical analyses of Waverly silt loam.

Number.	Description.	Fine gravel.	Coarse sand.	Medium sand.	Fine sand.	Very fine sand.	Silt.	Clay.
		Per cent.	*Per cent.*	*Per cent.*	*Per cent.*	*Per cent.*	*Per cent.*	*Per cent.*
18405	Soil	0.0	0.4	2.1	4.2	10.7	77.9	4.8
18406	Subsoil	.0	.1	.2	.7	15.8	79.4	3.5

NORFOLK GRAVELLY LOAM.

The surface soil of the Norfolk gravelly loam consists of a light-brown, medium sandy loam extending to a depth of 8 to 10 inches. There is present on the surface and mixed with the soil from 15 to 25 per cent of gravel, the fragments seldom exceeding 1 inch in diameter. The subsoil to a depth of 30 inches consists of a yellowish sand or sandy loam containing from 10 to 15 per cent of gravel. A gravel bed is sometimes encountered at 3 feet. Both soil and subsoil are subject to considerable variation. The soil may be a heavy sandy loam and the subsoil may grade into a heavy loam, silty loam, or clay loam at 2 or 3 feet.

This type occurs immediately at the foot of the bluffs bordering the delta and is derived from the Lafayette formation, which, lying immediately under the loess, is here exposed. The wash from the bluffs carries down the material from both of these formations, and the coarse material is left near the bluffs, while the finer and lighter particles are carried farther on. The Norfolk gravelly loam occupies only a narrow margin between the hills and the delta. It varies in width from a few rods to one-half mile, though it is not continuous.

The surface always has a gentle slope toward the delta and the natural drainage is good. It sometimes suffers from drought. The greater proportion of this soil has been under cultivation, but much

of it has been abandoned and allowed to grow up to sedge and brush.

The yields are small except during seasons of excessive rainfall. The soil is so loose and open that moisture is not long retained. The price of land of this type of soil ranges from $5 to $15 an acre.

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

Mechanical analyses of Norfolk gravelly loam.

Number.	Description.	Fine gravel.	Coarse sand.	Medium sand.	Fine sand.	Very fine sand.	Silt.	Clay.
		Per cent.	*Per cent.*	*Per cent.*	*Per cent.*	*Per cent.*	*Per cent.*	*Per cent.*
18389	Soil	1.5	17.3	28.7	15.0	6.3	26.9	4.7
18390	Subsoil	.9	15.3	35.1	18.8	7.6	19.7	2.7

MEADOW.

The surface few inches of the material composing the Meadow consists of a brown or drab silt loam. This is underlain by a drab, gray, or bluish silt or silty clay. In local areas and especially near the streams there is considerable sand present in both soil and subsoil.

The Meadow includes the lowlands along the streams of the upland section of the county, which are now unsuitable for tillage, and which never have been cleared of the original timber. This growth consists of water oak, black and sweet gum, sycamore, beech, and some cypress. The most extensive development is along the Big Black River. The surface is flat and broken only by sloughs, old oxbows, and bayous, former channels of the river. It is liable to overflow at any time of the year, and after heavy rains is always covered with water, which may stand on the surface for two or three weeks.

The type is still in process of formation, each successive flood bringing with it material that is left as a thin deposit over the bottoms. The soil is very rich, and if cleared, ditched, and diked would be capable of producing large yields. At present it is of value only for its timber and the pasture which it affords.

SUMMARY.

Holmes County, Miss., lies a little to the northwest of the center of the State and comprises an area of 524,992 acres or about 820 square miles. The drainage of the entire region is through the Yazoo and Big Black rivers into the Mississippi. The eastern two-thirds of the area lies in the upland section of the State, while the western one-third is within the Delta. The surface of the upland region varies from nearly level to rough and broken, with many badly eroded places. The Delta is almost level, although sloping gently away from the streams and bayous.

The first settlement in the area was made in 1826 and the county was organized in 1833. At present it has a population of 36,828. Lexington, the county seat, has a population of 2,000.

The area is traversed from north to south by the main line and a branch of the Illinois Central Railroad, and these two lines are connected by a small road running from east to west. Durant, a city of 2,300, on the main line, is 680 miles from Chicago and 242 miles from New Orleans.

The mean annual temperature of this region is 65° F., with a maximum of 107° and a minimum of —2°. The mean precipitation is 48.1 inches. The winters are mild, though the weather is very changeable, and the summers are long and warm.

The agriculture of the area is now in process of evolution and improvement. Cotton is still the money crop. The oats, corn, and hay produced are not sufficient to supply the home demand. The small fruit and trucking industries have been developed in the vicinity of Durant. The outlook for the fruit industry is not especially bright, but trucking can be profitably extended.

The average size of farms is 69.9 acres; individual holdings vary from 20 to 5,000 acres.

The average price of delta lands well located and about half cleared is $35 an acre, with a range from $8 to $60 an acre. In the hills the range in value is from $5 an acre in the eroded sections to $150 in the trucking region.

A systematic crop rotation should be followed, deeper plowing practiced, and, especially in the hills, ridge cultivation abandoned. More attention should be given to dairying and the raising of beef cattle and hogs. Winter forage crops such as rye, barley, oats, and vetch should be grown more extensively. Cowpeas, alfalfa, and other legumes may be used to increase the fertility of the soil as well as to furnish an abundance of nutritious feed. The washing of the soil may be greatly checked by deep cultivation and the incorporation of more organic matter in the surface soil.

The soils of the upland part of the county are derived from the mantle of loess which covers a large area in the State. Memphis silt loam is the most extensive type in the county. Its surface is rough and broken and in many places so badly eroded that it is of no value for cultivated crops. Its peculiar structure permits it to be readily washed away during heavy rains.

Richland silt loam has the same origin as the Memphis silt loam, and is also confined to the hill part of the county. Its surface is nearly level or gently rolling, and it is not as badly eroded as the former type. The soil is deeper than the Memphis loam, and it has a higher agricultural value. The trucking industry has been developed on this type.

The Lintonia loam is found along the stream bottoms in the uplands and at the foot of the bluffs, in the delta. It is a wash from the loess slopes, and is a distinct type. Along the streams it is sometimes flooded, but in the delta it is not subject to inundation. It is fairly well drained and is capable of being highly developed. Most of it is now under cultivation.

Waverly silt loam is also a wash from the loess slopes. It is confined to the delta and lies adjacent to the Lintonia loam. It is very low, subject to overflow, and much of it is now in the condition of swamp.

The type Norfolk gravelly loam occurs immediately at the foot of the bluffs, and is the result of wash from the Lafayette formation which is exposed below the loess. It is of very small extent and of little agricultural importance.

The term Meadow has been applied to the low-lying areas along the streams of the upland which are still uncleared, subject to overflow and wet most of the year.

The soils of the delta proper are all of alluvial origin, having been laid down by the Mississippi River and its tributaries in times of high water. The Yazoo fine sandy loam occupies the long, narrow ridges which border the water courses and form the front land. The type is of small extent, but practically all of it is under cultivation. It is very seldom flooded.

The Yazoo loam lies adjacent to the Yazoo fine sandy loam in long, narrow bands, and is a gradation type from the sandy soil to the heavy clays of the interior. It has a gentle slope away from the streams or water courses along which it is found and its natural drainage is fair, though parts of it are subject to overflow. It is the best soil in the delta.

The Wabash clay lies adjacent to the Yazoo loam and borders the large open swamps of the interstream areas. It is a strong soil, but is low and subject to overflow. If properly drained and well cultivated it will produce large yields.

The Sharkey clay occupies large interstream areas commonly called the "open swamp." It is the heaviest soil in the area and practically undeveloped. It is nearly all in timber, only a very small proportion having been cleared. It is naturally a strong soil, and if diked, ditched, and properly cultivated would be capable of producing excellent crops.

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