SOIL SURVEY OF MONROE COUNTY, MISSISSIPPI.

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DESCRIPTION OF THE AREA.

Monroe County is situated in northeastern Mississippi, in the first tier of counties along the Alabama line, and about 65 miles south of the Tennessee border. It was established in 1821, named in honor of James Monroe, and, as now constituted, is bounded on the north by Lee and Itawamba counties, on the east by Alabama, on the south by Clay and Lowndes counties, and on the west by Clay and Chickasaw counties.

The county of Monroe has, since its inception, sustained numerous modifications both as to shape and extent, but as now outlined it is roughly rectangular in shape and comprises an area of 761 square miles or 487,040 acres.

The topography of the county is rolling to undulating or comparatively level. The western two-thirds, with an approximate elevation of 300 feet, is characterized by comparatively smooth surface features, while the eastern one-third, constituting largely the hilly divide between the Tombigbee and Buttahatchie rivers, with an average elevation of about 375 feet, shows a rather strong relief. The general slope of the area is to the south, with regional drainage in a southerly direction and toward the principal drainage lines. The gently rolling to undulating limestone lands in the west give

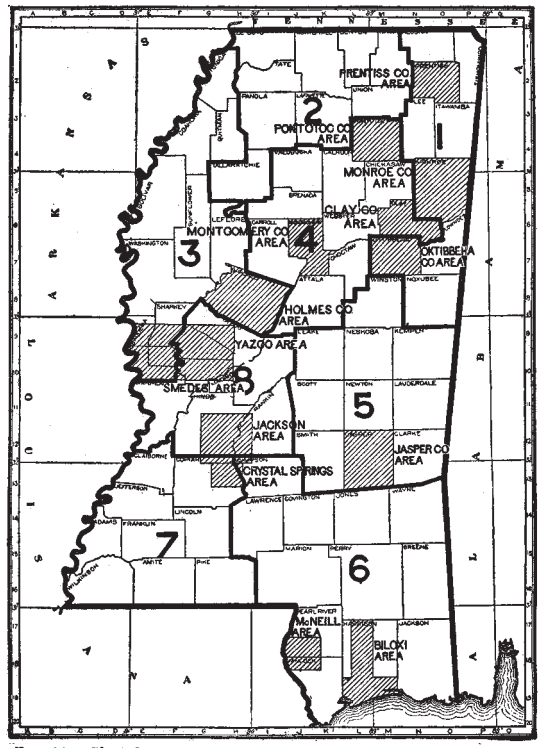

FIG. 20.—Sketch map showing location of the Monroe County area, Mississippi.

way to the comparatively level to gently rolling "flatwoods" and "post oak" lands to the east, and these in turn pass into the broad and level valley lands of the Tombigbee River, which flows across the central part of the county from north to south and with its tributaries constitutes the important drainage system of the area.

To the east of the Tombigbee drainage system is a hilly divide crossing the entire county from north to south, paralleling the valley lands. This narrow divide separates the waters of the Tombigbee River from those of the Buttahatchie River, the other important drainage line of the area. The valley of the Buttahatchie River, which is from 2 to 4 miles wide, has a rather level topography. The narrow strip of country between the river and the Alabama line is rolling to hilly, with drainage to the west into the river.

The early history of the section, prior to 1820, appertains almost exclusively to the Indians. The Federal Government instituted what is known as the Huntsville survey about 1820, opening up to settlement the lands eastward from the Huntsville meridian to the Tombigbee River and as far north as the Old Indian trail known as "Gaines Trace." The opening of these lands resulted in an influx of immigrants from sections of Georgia, Alabama, and especially from Tennessee, and their advent marks the time of the county's establishment. After the completion of the Chickasaw survey, about 1836, and the organization of the Chickasaw cession of 1832 into counties, opening up to settlement the fertile lands east of the Tombigbee River, there came many other immigrants from Georgia, Alabama, and Tennessee, representing largely descendants of the old Virginia and Carolina families who had settled chiefly along the Tennessee River in North Alabama, though to some extent in other sections of the mentioned States. These immigrants were in the main people of wealth, and among them was a strong sprinkling of the best Scotch and Irish elements. The Britons were also strongly represented. The advent of the negro dates from the time of the original settlement. Many additions were made from time to time to the county's population from the several States of the Union, but the present citizenship is practically all native and quite homogeneous.

The lands east of the Tombigbee River were the first settled, but with a steadily increasing population and enhancing land values, settlements were soon made on the lands west of the river. At present the settlement of the county is fairly general, though more dense in the gently rolling limestone lands in the western and the comparatively level to rolling lands in the northern, central, and southern sections. The hilly areas in the east and northeast sections of the "flatwoods" and a large portion of the low-lying alluvial soils along the larger stream courses are thinly settled and are the lowest in agricultural value under present conditions. Naturally the productiveness of the soil, its ease of cultivation, and the conveniences

of market facilities are the three factors determining largely the extent of settlement, and hence the country along the various railroad lines and near the commercial centers represent, in general, the portions of the county most thickly settled and most highly developed.

No section of the county has as yet reached a condition of settlement even approaching its capacity, and lands that are naturally unsuited to the staple crops have not been brought under cultivation, and even considerable areas of the more easily cultivated soils are handled with little regard to securing maximum yields. The conveniences of telephonic connections, rural mail delivery routes, etc., do much toward making the rural sections attractive, and with the establishment of good roads the unused lands will be brought under cultivation.

The population of the county in 1900, according to the Twelfth Census, was 31,216, of which 12,555 were white and 18,661 colored. Aberdeen, the county seat, situated near the center of the county on the Tombigbee River, is a thriving commercial center of 5,000 inhabitants and the largest town of the county. There are several industrial enterprises of importance located at this point, which utilize some of the natural resources of the section. Three branch lines of railroads enter the town, and the Aberdeen and Tombigbee Valley Railroad from Okolona to Pensacola, Fla., now in process of construction, is expected to furnish the town with one through line. Amory, in the north-central part of the county, on the Frisco Railroad, is also a thriving town of 1,500 inhabitants and the second in importance in the county. Gibson, Prairie, and Muldon, on the Mobile and Ohio Railroad, Strongs, on the Illinois Central Railroad, and Bigbee, Quincy, and Gattman, on the Frisco, are local railroad settlements, while Smithville, Athens, and Hamilton, in the northern, central, and southern parts of the county, respectively, are small rural towns and among the oldest settlements in this section of the State. Greenwood Springs, in the eastern part, is a small settlement on the Frisco Railroad and a summer resort of much local importance.

Monroe County is traversed by three systems of railroads now in operation and a fourth one in process of construction. The Frisco crosses the northeastern section in a northwest and southeast direction, with a branch line extending from Amory to Aberdeen. The Mobile and Ohio traverses the western prairie belt from north to south, with a branch line from Muldon to Aberdeen. The Aberdeen and Tombigbee Valley Railroad, now building, will traverse the central part of the county in a northwest and southeast direction. This network of railroads, with their numerous local shipping points, directly connecting the large centers of the South, affords all sections of the county convenient and ample market facilities.

The public roads are as yet largely unimproved, though a recent inauguration of the contract plan for improving them is giving some

good results. There is an abundance of gravel in various sections of the county, and while little of this material has been utilized so far for road building, it will eventually be used for this purpose. A system of good roads would greatly promote the general welfare of the entire area.

The drinking water of the county is obtained from surface wells from 10 to 75 feet deep, and from artesian wells, from 250 to 2,000 feet in depth. The surface wells are invariably good, except when subject to the leachings of the limestome rock high in calcium carbonate, when the lime content tends to make the water unpalatable. The artesian wells supply a healthful water that invariably contains some iron salts. In many sections of the county, especially over the level sandy valleys of the Tombigbee and Buttahatchie rivers, the bountiful supply of artesian water may become of much value for irrigating truck or other special crops.

CLIMATE.

The climate of Monroe County is typical of the warm temperate zone of the Southern States. The winters are relatively short and mild and the summers are long and hot, a condition that affords a long growing season for crops, as well as a wide range for diversification. Cultivation can be carried on practically the year around. The county is situated too far from the Gulf to be affected by the Gulf breezes, and its elevation above sea level is insufficient to give it a rarefied atmosphere. The temperature ranges from 25° F. in winter to 100° F. in summer, with an average of about 42° for the winter and 80° for the summer. There are frequent variations during the winter months, but none of an extreme nature. Freezes may occur from time to time, but they are of short duration. Snows rarely occur. The humidity intensifies the sensible temperature during the winter months as well as the heat of summer, which is generally oppressive from June to September.

The following table, compiled from the records of the Weather Bureau station at Aberdeen, shows the dates of the last killing frosts in spring and the first in fall for a series of years, with average dates for the entire period:

Dates of first and last killing frosts at Aberdeen.

Year.	Last in spring.	First in fall.	Year.	Last in spring.	First in fall.
1898	Apr. —	Oct. 27	1903	Mar. 26	Oct. 25
1899	Mar. 26	Nov. 3	1904	Apr. 5	Oct. 23
1900	Apr. 1	.....	1906	Mar. 21	Oct. 11
1901	.....	Nov. 6	1907	Apr. 14	Oct. 29
1902	.....	Nov. 28	Average	Mar. 31	Oct. 31

The annual rainfall is about 47 inches, with the highest average precipitation during the winter and spring months and the lowest during the months of September, October, and November. The rainfall is fairly well distributed throughout the year and crops seldom suffer from drought, and tillage methods looking to the conservation of the soil moisture would prevent any possible damage to crops from the occasional dry seasons. Summer rains usually occur in the form of showers or thunderstorms, while the winter rains are continuous downpours, resulting in much erosion over the rolling areas and extensive flooding of the depressions and valleys.

The following table, compiled from the records of the Aberdeen station, gives the normal monthly and annual temperature and precipitation:

Normal monthly and annual temperature and precipitation at Aberdeen.

Month.	Temperature.	Precipitation.	Month.	Temperature.	Precipitation.
	° *F.*	*Inches.*		° *F.*	*Inches.*
January	41.4	3.99	August	78.6	3.77
February	40.6	5.13	September	72.6	2.62
March	54.4	5.41	October	61.0	1.98
April	62.2	3.63	November	50.4	3.14
May	70.3	2.86	December	42.2	4.84
June	78.1	5.24			
July	80.3	4.41	Year	61.0	47.02

AGRICULTURE.

The territory now embraced within the limits of Monroe County was originally a part of the Chickasaw Indian domain. The treaty of 1816 on the part of the Chickasaw Nation gave the National Government the lands included in the "Original county of Monroe," consisting of some half million acres along the Creek frontier. All claims to this land were adjusted within a few years, and Mississippi recognized it as a possession in 1821, establishing the county. The valley of the Tombigbee River is probably the earliest line of settlement in northern Mississippi and the section first given to active agricultural pursuits. The earliest settlers coming to the frontier made their homes on the lighter sandy soils east of the river, where cultivation was easy and a water supply plentiful. The oldest settlement in the county, and probably the oldest abandoned town in northern Mississippi, is Cotton Gin Port, on the Tombigbee River, some 4 miles west of Amory. This was an important frontier post when the treaty of the Chickasaw Custom House made Gaines Trace and the Tombigbee River boundary lines between American and Chickasaw territory.

The agriculture of these early days consisted of a crude culture of cotton, corn, fruits, and vegetables over the more easily tilled and productive soils. The pioneer settlers, as well as the Indians, obtained a livelihood chiefly by fishing and trapping, supplementing their food supply by growing limited areas of corn and vegetables. To encourage the growing of cotton and to pacify the prejudices of the Indians, the Federal Government constructed a primitive cotton gin at this frontier post over one hundred years ago. Old Hamilton, in the southern part of the county, in the forks of the Buttahatchie and the Tombigbee rivers, was also an early settlement and the county seat until 1830, when the distinction was transferred to Athens, in the central part of the present county. Aberdeen, laid out in the thirties and incorporated in 1837, was made the county seat in 1849 and has been the chief agricultural center ever since.

Cotton soon became the leading crop. Horsepower gins were used, and the raw product was shipped from Cotton Gin Port and later from Aberdeen by way of the Tombigbee River to Mobile, where it was exchanged for money and the year's supplies. The later introduction of steam gins gave an impetus to cotton production and the acreage was steadily increased. The production of grain and other common farm crops kept pace with the agricultural development. In the early sixties the Mobile and Ohio Railroad traversed the western part of the county from north to south, affording more convenient facilities for marketing the cotton crop and for the importation of supplies. It was some years later that Aberdeen, the chief distributing point, was connected by a branch line from Muldon.

The agricultural pursuits of Monroe County have not materially changed since its early history. Conditions have improved with settlement, development, and general advancement, but the area has always been distinctly a cotton-growing section, with corn, oats, wheat, sorghum, melons, potatoes, peanuts, vegetables, numerous fruits, berries, cowpeas, alfalfa, Johnson grass, melilotus, etc., as supplementary crops to meet in part the demands of the community. No general system of growing crops in beneficial rotation has ever been practiced, and until very recently no attention has been given to the adaptation of soils to crops.

Commercial fertilizers are used extensively on the lighter sandy soils, while the "prairies," or limestone lands, are devoted year after year to the production of cotton or corn without fertilizers of any kind. These limestone soils being probably the strongest of the area, can better withstand the continual drain of the one-crop system, but the lighter sandy soils of the east are soon reduced to a low producing capacity. The average yield of cotton on the limestone lands is about one-half bale to the acre, the moderate yield being due to the clean-culture, one-crop system, and inadequate tillage methods. Yields

may be higher or lower, according to climatic conditions or seasons, but it is quite feasible to employ methods of cropping and of tillage that could control almost any adverse conditions and bring about a consistent good yield. The adaptation of this limestone soil to alfalfa is being quite generally recognized, and the acreage of this crop is increasing from year to year with paying returns. It will probably prove one of the very profitable staple crops of the prairie belt.

The lighter sandy soils, which occur largely east of the Tombigbee River, are better adapted to a variety of crops than the black prairie clays, and while their productiveness may be reduced through inconsiderate methods of cropping and cultivation, they are capable of giving profitable crops indefinitely if properly cultivated. They are easily handled, well drained, respond readily to fertilizers, and are susceptible of permanent improvement, and in this case particularly the importance of crop rotation, adequate tillage methods, and the addition of organic matter can not be overestimated. In the absence of stable manures, a leguminous crop every two or three years, preferably cowpeas, to be plowed under, is recommended to supply the necessary humus to the soil.

Cultivation is practically along the same lines as it was years ago, except by some of the more progressive farmers, who employ efficient labor-saving machinery and practice improved methods leading to intensive cultivation. Crops are, however, generally planted and matured with as little expense as possible. The preparation of the land commences immediately after the late winter rains of January and February, when the land is broken from 3 to 5 inches deep and allowed to stand until planting season before it is bedded and seeded. The method generally followed is to allow the cotton lands to remain untouched throughout the winter season, and to prepare them for cotton in the spring by simply running a plow down the old seed bed and bedding the land over the old bed furrow between the former rows. During the planting season, or when the land is bedded, commercial fertilizers are drilled in at the rate of about 200 to 300 pounds to the acre. Some of the more progressive farmers who own and cultivate their own farms have adopted methods that are far more effective in producing increasing yields. The crops are rotated, and the lands are plowed deeply in the fall and seeded with some winter cover crop, which prevents any extensive washing and also affords a supply of organic matter with its resultant benefits.

The present careless and inefficient treatment of land is due largely to the prevailing system of tenantry. The tenant, having only an immediate and temporary interest in the land he tills, plants and matures his crops of cotton and corn with the least possible expense, curtailing tillage and fertilizer applications to a minimum, which practice, while disastrous to the land, is nevertheless profitable to the

landowner, for his share of the crop returns is a high interest on the value of the lands. In certain sections of the county the good yields on limited areas well cultivated by the owners are in noticeable contrast to the results secured by the average tenant farmer.

The one great inexhaustible natural resource of the county is the soil, and the area will always be, primarily, an agricultural district. No section of it has yet reached its possible producing capacity. The abundance of land, conditions of tenure, and the easy methods of cultivation are factors retarding a more progressive and more highly developed agriculture, but a spirit of progress is clearly shown by an increasing interest in agricultural pursuits and a more general prosperity throughout the county.

To effect a more comprehensive utilization of the great soil resources of the county and to bring about a more intensive and profitable agriculture the following suggestions are offered: First, a wider diversification of crops, including possibly the introduction of new crops and the selection of crops according to soil adaptation; second, the more economic production of the staple crops of cotton and corn, which can be largely brought about by deeper plowing, to prevent erosion and to produce a superior seed bed; third, a systematic rotation of crops, including the frequent use of cover crops to be plowed under, preferably a legume, to supply necessary humus to the soil, and last, the practice of careful seed selection.

The farm labor is largely colored and the supply is usually equal to the demand. It is chiefly unskilled, but fairly efficient under supervision. The method of employment is usually by contract for the year, with a monthly wage of from $10 to $15 with subsistence, though much day labor is employed, especially during the rush of the cotton chopping and cotton picking seasons. The daily wage ranges from 75 cents to $1.50, the rate being determined by the demand. Occasionally day labor is paid by piecework, which averages about $1 a day. The cotton chopper receives so much per acre and the cotton picker so much per hundred pounds, the price being about $1 per acre for choppers and about 75 cents a hundred pounds for picking.

Owing to the absence of near-by industrial centers the native labor is fairly well distributed throughout the area, and while the labor is not entirely adequate and satisfactory, the question presents no such serious difficulty here as exists in many other sections of the South.

For the most part the farming is carried on by tenants on a share basis or for a cash rent per acre. When the owner furnishes all work stock, land, seed, and house for tenant, he receives one-half of all crops; when he furnishes only the land and a house for the tenant he receives one-fourth the products. The cash renter pays $2 to $5 an acre, according to the productiveness of the land; the black

prairies, being the most productive soils, naturally command the highest rent.

According to the census of 1900 there were 372,738 acres in farms, of which 187,404 were improved. The average size farm was 76.8 acres, and 27.9 per cent of the farms were operated by owners. The value of farm lands and improvements, farm buildings, implements, and machinery, and live stock amounted in 1899 to $4,985,595, the expenditures for labor and fertilizers $82,910, and the value of products not fed to live stock $2,009,066.

SOILS.

Monroe County lies wholly within the broad physiographic division known as the Coastal Plain Region. Various geological formations influence the character of the soil material, and while the soils follow more or less distinctly the broad lines of the original formations, many complications are encountered. Three geological formations constitute the substrata of the county—the Selma chalk in the western, the Eutaw (Tombigbee) in the central, and the Tuscaloosa in the eastern part—all extending in a general north and south direction and belonging to Cretaceous time. The Selma chalk alone of these three formations gives rise to a soil material uninfluenced by more recent deposits, the Eutaw and Tuscaloosa being covered by the sedimentary Lafayette and Columbia formation and to a less extent by alluvial deposits of Recent age.

The Selma chalk formation, or rotten limestone, is a stratum of impure fine-grained Cretaceous limestone, underlying the western part of the county. Its thickness varies from less than a hundred to several hundred feet, the depth increasing toward the south, and the percentage of calcium carbonate also becomes higher as one proceeds south. The formation was laid down in a rapidly deepening sea at the close of Cretaceous time and has in its unchanged condition a characteristic bluish tint. On weathering it becomes a whitish color, while the resulting soil product invariably has a dark-gray to black color. This formation gives rise to the broad "prairie" or "black lands" in the western part of the county, the soil being technically known as the Houston clay.

In the more rolling areas or bluffs that skirt the stream bottoms small areas of the exposed limestone frequently occur, resulting from severe erosion; such areas were mapped as Houston chalk. The reworked material from the limestone found as marginal strips of varying breadth along the streams that flow through the limestone areas, having been transported through the action of surface waters or taken in suspension and deposited at lower levels during periods of excessive rainfall and overflow, is designated as Trinity clay. To the west of the Houston clay and extending, roughly, to the more

recent deposits of the rolling sandy country and the Tombigbee Valley soils, are extensive, comparatively level to rolling areas, the soil material of which is closely related to the Selma chalk derivatives. These areas support a growth of hardwood and include much of the land that is locally termed "post-oak land." The formation giving rise to this material appears to be more or less calcareous laminated clay. It is a later deposit than the Selma chalk, and was evidently laid down while the lime rock was yet submerged. Capping some of the higher elevations over this formation is a thin mantle of the Lafayette, which no doubt influences the color of at least some small areas. Over the zone of this argillaceous deposit the Oktibbeha clay, Oktibbeha clay loam, and Oktibbeha silt loam are developed extensively, while in depressions and poorly drained areas the Lufkin clay predominates, with some small areas of the Lufkin silt loam.

The soil material east of the general line of the Tombigbee River belongs to Quaternary time and includes the Lafayette, Columbia, and Recent deposits. The Lafayette formation, consisting of strata of sand and sandy clay, is developed extensively over the rolling and hilly divide between the Buttahatchie and Tombigbee rivers, extending entirely across the county from north to south. It also occurs in small areas about 3 miles south of Aberdeen and in the forks of Old Town Creek and the Tombigbee River, in the northern part of the county.

Throughout the extent of this formation occur the Orangeburg soils, the Orangeburg fine sandy loam predominating. Wherever erosion has been active in transporting the sandy surface material, the sandy clay has been exposed, giving rise to the Orangeburg clay type, which is found chiefly on the slopes of the hills or ridges.

Closely associated with the Orangeburg soils is the Guin type of soil, found extensively in the northeastern and eastern sections of the county upon the rolling to hilly uplands skirting the Buttahatchie Valley, the Sipsie River Valley, and Splunge Creek. Over some of the hills occupied by the Guin fine sandy loam are found ferruginous sandstone masses, the only consolidated rock fragments found in the area. This soil is developed extensively in Lamar County, Ala., under the same conditions as in this county. The color is a brownish to reddish yellow, and the soil differs from those of the Orangeburg series chiefly as to color. The sedimentary deposit is no doubt of the same age as the Lafayette, its color being influenced by manner of deposition or mineralogical composition. Being, as a rule, of very hilly topography, the Guin fine sandy loam has little agricultural value and is prized chiefly for its timber growth of hardwood and pine.

The Columbia formation, consisting of a deposit of brown and yellow loams, is found extensively over the broad and gently rolling

to undulating strip of country between the Tombigbee River and the hilly divide separating the two large drainage lines. It also mantles certain areas of the Lafayette formation, as evidenced by outcrops of that red material on the slopes or escarpments passing to lower levels. It is possible that the Guin type of soil owes its origin in part to this formation, for these brown and yellow loams are found over most of the hill country of Mississippi.

The yellow loams in this area have given rise to the Norfolk fine sandy loam and Cahaba silt loam, while the brown material has influenced the development of the Amory fine sandy loam.

In the depressions and poorly drained areas which admit of little or no aeration and oxidation, the underlying clays are generally of a tenacious, impervious nature and a grayish-white color; such areas were included in the Lufkin series.

The recent deposits give rise to all the types established along the stream courses. These have been formed through water action since the recession of the ancient sea. The Tombigbee River Valley, varying in breadth from 2 to 6 miles, shows a compilation of soil material which results in several types of soil. Comparatively little of these bottoms is under cultivation. Three soils were mapped as follows: Cahaba fine sandy loam, Cahaba loam, and Ocklocknee clay loam, with boundaries more or less arbitrarily drawn. The Cahaba fine sandy loam occurs over the highest and oldest of the alluvial terraces and is little subject to overflow. The line of separation from adjoining soils derived from distinct geological formations is often insensible and as drawn wholly arbitrary. The Cahaba loam represents a rather silty material along second bottoms, and is inundated during excessive rainfall. The Ocklocknee clay loam includes all the immediate overflow lands and depressions which may be found scattered promiscuously over the valley area. By far the larger part of the Tombigbee bottoms is thickly covered with hardwood and gum and a luxuriant growth of underbrush. A detail traverse of this section would have required more time than seemed to be justifiable. Extensive drainage will be necessary before these fertile soils can be developed for agricultural purposes. The Ocklocknee silt loam is a valley or bottom soil of the Buttahatchie River, differing slightly from those of the Tombigbee River, on account of the limestone wash of the latter. Along the smaller streams the alluvial material gives rise to the Ocklocknee loam.

Twenty-two types of soil were established in the county, occurring chiefly as derivative material from the underlying geological formations and as reworked material transported by surface waters or taken into suspension and deposited by the river waters during seasons of overflow. Local conditions of erosion, oxidation, etc.,

have combined to modify certain small areas over extensive types, and, in some instances, have resulted in creating such characteristic differences that distinct soil types have been formed.

The following table gives the name and the actual and relative extent of each type:

Areas of different soils.

Soil.	Acres.	Per cent.	Soil.	Acres.	Per cent.
Orangeburg fine sandy loam	92,992	19.1	Amory fine sandy loam	15,744	3.2
Houston clay	58,176	12.0	Cahaba loam	15,232	3.1
Cahaba silt loam	49,664	10.2	Lufkin silt loam	12,352	2.5
Cahaba fine sandy loam	33,024	6.8	Oktibbeha clay	11,456	2.4
Guin fine sandy loam	29,568	6.1	Lufkin clay	3,392	.7
Trinity clay	27,904	5.7	Myatt fine sandy loam	2,432	.5
Oktibbeha clay loam	24,000	4.9	Susquehanna fine sandy loam	1,664	.3
Ocklocknee clay loam	23,616	4.9	Oktibbeha fine sandy loam	1,664	.3
Ocklocknee loam	22,912	4.7	Orangeburg clay	1,600	.3
Oktibbeha silt loam	22,400	4.6	Houston chalk	512	.1
Ocklocknee silt loam	20,544	4.2			
Norfolk fine sandy loam	16,192	3.4	Total	487,040	

It is thus seen that Monroe County offers a diversity of soil types sufficient to warrant a very diversified agriculture. The fertile first and second bottoms along the Tombigbee and Buttahatchie rivers, together with the alluvial soils of their larger tributaries, present a vast acreage of clay loams, loams, and sandy loams that are susceptible to improvement and a profitable use in the production of many different crops. The upland soils vary in structure from the stiff, heavy black clays of the undulating prairie land to the light sandy soils of the hilly sections in the eastern part of the county. None of these soils are as yet given to intensive cultivation and little regard is paid to their fitness for special crops. Yields are generally rather low, and cultivation is confined largely to the stronger or more easily tilled areas. The limestone soils are probably the strongest of the area and, despite the continual drain of the clean-culture, one-crop system, they maintain a rather high state of productiveness. The lighter sandy soils under similar treatment are soon reduced in productivity, and commercial fertilizers are demanded for profitable returns. With the introduction of improved methods and a proper system of crop rotation these soils can be vastly strengthened and improved. There is very little land in the county that can be considered of doubtful value for agriculture.

HOUSTON CLAY.

The soil of the Houston clay, to a depth of from 10 to 15 inches, is a brownish-gray to black clay loam to clay. It grades or often passes more abruptly into a lighter-colored subsoil of practically the same

texture, being, however, more plastic and tenacious, because of the higher moisture content and the lower content of organic matter. The type varies somewhat where influenced by difference in topography or the proximity of other geological formations. Areas were encountered which showed a black to drab-colored material 3 feet deep, such areas being confined chiefly to the rather level or depressed sections of the prairie belt. The brownish-gray phase is found only on the slopes of the gentle swells or knolls that mark the more elevated areas. This phase may show a decided brownish color 3 feet deep, or, where the limestone is sufficiently near the surface, the whitish partially rotted material may be encountered at from 24 to 36 inches. Small rock fragments, remaining from the weathering of the limestone, are quite numerous. Much of the typical Houston clay of this area will show a decided brownish clay subsoil underneath the dark-gray to black surface soil, with the brownish material resting directly on the unaltered Selma chalk formation. The brownish color of the material in this position is no doubt due to the oxidation of certain iron compounds in the original limestone. That the coloring does not extend to the surface is due to the complete process of weathering, thorough leaching, and the incorporation of more or less organic matter. Where the limestone is consistently at or near the surface, as is true only of the more rolling sections of the prairie lands or along the slopes of stream valleys, the surface soil will vary from brown to a grayish white in color, and the subsoil will show a correspondingly grayish-white color with the rotten lime rock at from 18 to 36 inches below the surface. Such areas generally show some fossil shells that have remained from the weathering of the limestone material.

The Houston clay being of very fine texture and close structure becomes quite sticky and tenacious when wet and bakes hard on drying. Cultivation is more or less difficult, but when handled at the right moisture content the soil becomes loamy and friable.

The type occurs in the western part of the county from north to south and is known as the "prairie," or "black lands." The limestone formation from which it is derived is continuous with the formation that is found extensively in Lee, Chickasaw, Clay, Lowndes, Oktibbeha, and Noxubee counties, where it gives rise probably to similar soil conditions.

The surface of the Houston clay is undulating to very gently rolling, with some comparatively level areas in the prairie belt proper and some rather hilly areas along the border of the limestone formation. Drainage as a rule is good, though much of the lower lying areas or depressions would be benefited by artificial drainage, preferably by the use of tile. From the crests of the gentle elevations there is an easy decline to the broad and shallow valleys which furnish outlet for excess rainfall. Such a condition precludes any severe or even harm-

ful erosion, if any regard be given this feature of soil management. The larger drainage lines show broad and comparatively level valleys with well-worn stream channels from 6 to 25 feet deep, which can accommodate all rainfall, except during the heavy rainy seasons when the entire valleys may be inundated. On the more rolling to hilly areas erosion is often more or less severe, and numerous gullies or washes are often found extending down the slopes, or the rotten limestone may be exposed, giving rise to the type of soil mapped as Houston chalk.

The Houston clay is derived from the weathering of the Selma chalk formation of Cretaceous age. This formation is a rather impure and loosely structured lime rock. There appears to be a covering of a later calcareous deposit, often approaching an argillaceous shale, over a portion of the Selma chalk formation, probably laid down while the lime rock was under water, and this later material enters into the formation of portions of the Houston clay, though, by itself, it gives rise to a soil material so different from Houston soils that a new soil series was established to cover it. No doubt the larger part of the Houston clay represents the residue from the weathering of the limestone formation, without the admixture of any other material.

This Houston clay supports no timber growth, and practically all of the type is cultivated except the rather hilly areas, which are left in native grasses and utilized as pasture. Cotton and corn are the chief crops, though the recent introduction of alfalfa and its successful culture may make this one of the staple crops of the limestone lands. While the soil is not well suited to trucking, various vegetables in small patches are grown for home consumption. Corn will yield from 25 to 60 bushels per acre and cotton from one-third to three-fourths bale per acre, according to seasons and methods of management. Little attention has been given toward conserving or increasing the fertility of this soil and the yields depend on the innate producing power of the soil. No systematic rotation of crops is practiced and little fertilizer is used. The natural productiveness of this soil seems in many cases almost inexhaustible. Instances were noted where cotton had been grown continuously on the same field for twenty-five years, maintaining a yield of one-half bale to the acre, without the addition of any organic matter or mineral fertilizers during the entire period. The practice of cultivating this soil to the clean-culture crops, like cotton and corn, year after year, is responsible in part for its stiff, tenacious nature. A rotation of crops, including a legume every few years to be plowed under, would tend to loosen up the soil and also tend in other ways to make the fields more valuable for the staple crops. It is advisable to plow this soil deeply in the fall, 10 or 12 inches, and to practice frequent and

shallow cultivation during the growing season. This method would prevent any serious erosion, tend to conserve the soil moisture in case of summer droughts, and break down the compact soil structure.

This limestone soil appears to be eminently adapted to the growing of forage crops, especially alfalfa, sweet clover (*Melilotus alba*), and Johnson grass. The growing of alfalfa will no doubt be found profitable and will unquestionably take its place as one of the staple crops. In this connection live stock and dairying could be made important industries. For alfalfa the land should be well drained, free from weeds, and the seed bed thoroughly prepared. It appears that the entire section is well inoculated; but if it is not, a sprinkling of earth from a seeded area will meet the requirements. Often a fair dressing of lime is advisable prior to seeding, as leaching may have removed most of the original lime content of the immediate surface. While Johnson grass grows well, lands are seldom seeded to this crop, because it is more or less a pest in cotton and corn fields. Melilotus is indigenous to the soil and is found growing over most of the uncultivated areas.

The Houston clay is probably the strongest upland soil of the area and has a value of from $25 to $75 an acre, according to location and conditions of improvement.

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

Mechanical analyses of Houston 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.*
19022, 19024.....	Soil.....	0.1	0.7	0.9	5.6	14.1	56.9	21.6
19023, 19025.....	Subsoil.....	.0	1.2	.9	7.7	11.9	50.4	28.1

HOUSTON CHALK.

The soil mapped as Houston chalk is developed in the area to a very limited extent. It represents exposures of the more or less disintegrated Selma chalk formation of Cretaceous time. The exposures are the result of rather severe erosion, and they naturally occur on the slopes of the more rolling lands and along the escarpments of the larger stream courses. The accumulation of soil in such places is largely prevented by continual washing. There may be here and there a few inches of loose grayish-white material on the surface, but not enough to allow the growing of crops. When the accumulation is sufficient to create a surface soil, erosion is less severe and the color of the soil becomes darker; in such cases the material becomes the Houston clay.

Cultivation of the Houston chalk is impossible, as the areas are invariably deeply gullied. Such areas can be reclaimed and fitted for cultivation by adapting methods to hold the weathered material in place until a soil can be produced, and this perhaps can be best accomplished by growing Melilotus. This plant will flourish on the exposed limestone, and when thickly seeded tends to check considerably the processes of erosion. The only profitable utilization of such areas is in growing this forage crop.

TRINITY CLAY.

The soil of the Trinity clay, to a depth of from 8 to 15 inches, is a very dark-gray to black clay loam or clay. The subsoil is of a lighter color, generally drab to gray, though the darker color may sometimes extend to a depth of 3 feet. Occasionally along a stream course that marks the boundary of the limestone formation the lower depths of the soil section may show a brownish color, owing to the fact that reworked material from the limestone has been mixed with other material which is a residual product of the underlying formation.

The Trinity clay is stiff, tenacious, and plastic when wet. On drying, the surface bakes hard and cracks. It is generally much darker in color than the Houston clay, owing no doubt to the presence of much organic matter.

The Trinity clay occurs only in the western part of the county, along the stream courses which flow through the limestone areas. It holds a marginal position along the channels of both the large and small streams, and has a comparatively level topography. Over the depressions and broad level valley lands natural drainage is often inadequate, and ditches are necessary to carry off excess water.

Like the Houston clay, when handled at the right moisture content the present type responds in a good tilth; but when plowed too wet it breaks in clods that are broken down with difficulty, and when plowed too dry the same difficulty is experienced in procuring a well-pulverized seed bed. If plowed deeply in the fall or winter an excellent structure is secured for spring and summer cultivation.

The Trinity clay is a derivative soil from the Selma chalk formation. It is reworked material. Found only in depressions or as marginal strips along stream courses, it represents the weathered product of the Selma chalk which has been transported from the surrounding elevations through the action of surface waters or which has been taken into suspension and deposited along stream courses during seasons of excessive rainfall and overflow. The type is largely subject to inundation during the rainy seasons of the winter months.

A phase of the type, found in two areas, one along Tallabinnela Creek and the other near James Creek in connection with the limestone wash, consists of from 6 to 10 inches of a rather heavy silt loam of a grayish-brown to dark grayish color. It has a rather level topography, and drainage is naturally inadequate. This phase is derived from the wash material from the surrounding elevations and that transported in suspension and deposited during overflows. The reworked material is largely from the limestone areas, though there is some silty material from the Oktibbeha soils.

Being a very productive soil, most of the Trinity clay is under cultivation and generally planted to cotton and corn. Corn produces from 40 to 75 bushels and cotton from one-half to three-fourths bale to the acre without any fertilizers. The soil seems to be well suited to forage crops. Many areas support a luxuriant growth of Johnson grass, but as this crop is controlled with difficulty, it practically precludes any frequent rotation and is not very popular. When well seeded it yields from 2 to 4 tons to the acre, and the farmer should expect to let it run for several years. When the soil is well drained alfalfa will do well, but owing to the danger from floods over a large part of the type and the consequent drowning of the plants it is not recommended for this crop, especially as there is an abundance of upland prairie soil that is better suited to the habits of the plant.

While this soil contains some organic matter from the wash of the surrounding elevations, its stiff, intractable nature could be advantageously modified by the incorporation of more organic matter in the shape of roots and stubble plowed under. A good mechanical or physical condition of the soil is no doubt the most essential factor in securing high yields. Good drainage, deep plowing in the fall, and frequent shallow cultivation during the summer season would do much to equalize the yearly crop returns, as it would tend to prevent any severe distress to crops either in wet seasons or in droughts.

The soil has a value of from $10 to $60 an acre, according to location and conditions of improvement.

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

Mechanical analyses of Trinity 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.*
19056	Soil	0.0	4.2	2.2	11.3	4.5	39.3	38.7
19057	Subsoil	.0	2.9	1.3	13.5	7.1	36.8	38.4

OKTIBBEHA CLAY.

The soil of the Oktibbeha clay, to a depth of 8 to 12 inches, is a brownish to reddish-brown clay, often approaching a clay loam in texture. The first inch or two of the surface soil, especially over the more level areas, has a very silty texture, but this quickly passes into the reddish clay. The subsoil is a mottled gray, yellow and red or brown clay, very plastic and tenacious, with a small content of the finer grades of sand. The red mottling decreases with depth, owing to diminishing agencies of aeration and oxidation. The more hilly or rolling the surface, the better the aeration and oxidation; hence the redder phase of the type found in such areas. The Selma Chalk formation is generally found at 3 to 10 feet below the surface, with occasional exposures showing the brownish clay resting directly on the limestone.

This soil is a heavy plastic clay, very compact, and intractable, and cultivation is carried on with more or less difficulty. The greater proportion of the area is still timbered with a growth of hardwood and some pine.

The Oktibbeha clay occurs chiefly associated with limestone soils, and is found only in the western half of the county, being largely confined to the outer edge of the prairie belt. Its most extensive occurrence is between the prairie lands and the later deposits giving rise to the more hilly and sandier soils to the east, though limited bodies may occur in the Houston clay area. This soil is very clearly distinguished from the Houston clay by the timber growth of hardwood which seems to be indigenous thereon, the Houston clay supporting no timber growth at all. The more rolling areas of the Oktibbeha clay often show a thin mantle of the Lafayette formation on the crests of the hills or ridges, and it is quite probable that in some instances the reddish coloring of the type has been imparted through the influences of this latter formation. The topography, as a whole, varies from gently rolling to comparatively level, with drainage generally good except over the more level areas. Owing to its close, compact, sticky nature the soil is not especially productive, and the yields are generally low. Deep plowing, affording a better aeration and oxidation, and the incorporation of organic matter in the shape of roots and stubble will tend to loosen up the compact clay and render it more friable. Areas that are cultivated from year to year, with due regard to improving mechanical condition, show it to be a soil that may be worked into good tilth.

This soil is derived from a calcareous laminated clay of Cretaceous time, which is included broadly in the Selma Chalk formation. There is such a great difference between the soil material (Houston clay) weathered from the typical Selma Chalk and the Oktibbeha clay weathered from this argillaceous shale that it is quite impossible to

give them the same origin. While the Selma Chalk formation may, geologically, include the material giving rise to the Oktibbeha clay, it is quite probable that the latter represents a later deposit than the Selma Chalk, having been laid down while the lime rock was yet submerged. On the other hand, it is an older formation than the Lafayette, which is often found capping some of the higher elevations.

On the cultivated areas fair yields of cotton and corn are produced. The soil has a value of from $10 to $40 an acre.

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

Mechanical analyses of Oktibbeha 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.*
19006	Soil	0.0	1.3	0.6	5.4	7.3	42.9	42.2
19007	Subsoil	.1	1.0	.5	5.4	10.5	46.2	36.2

The following samples contained more than one-half of 1 per cent of calcium carbonate ($CaCO_3$): No. 19006, 15.53 per cent; No. 19007, 11.39 per cent.

OKTIBBEHA SILT LOAM.

The soil of the Oktibbeha silt loam is a gray to brownish-gray heavy silt loam 6 inches deep. The texture often approaches a clay loam, especially where the surface is subject to any noticeable erosion. The subsoil is a mottled gray, yellow, and red or brown clay, heavy and plastic, gradually passing at lower depths into a material of practically the same nature, but with less of the bright mottling. This soil is cultivated with less difficulty than the clay type, though it requires care to prevent the soil material from running together.

The topography is gently rolling to comparatively level, with the more level areas predominating. Drainage is often sluggish and artificial methods have to be employed. The native timber growth is hardwood, though there is often a sprinkling of pine.

In origin and process of formation the type is similar to the Oktibbeha clay. The easy relief, precluding any severe erosion, has permitted the accumulation of a gray, silty surface soil, with more or less organic matter, and this has caused enough difference to justify the separate type name. This soil is found only in the western part of the county over the calcareous clayey deposit of Cretaceous time, from which the Oktibbeha series of soils is derived.

Cultivated areas of the Oktibbeha silt loam are used for the staple crops, cotton and corn, with the other common farm crops and vegetables grown in limited quantities for home consumption. Yields are poor to good, depending on the methods of cultivation and the conditions of improvement. In its unimproved state the soil has a very low agricultural value, but it can be profitably util-

ized through proper handling, as it responds to cultivation quite readily. Being a heavy, fine-grained material, if allowed to stand long in level areas without stirring, the soil becomes very compact, until there is absolutely no aeration, no oxidation, or any of the conditions that make for plant growth. The soil needs to be stirred deeply and given an abundance of organic matter. Cowpeas, melilotus, rye, etc., sown broadcast and plowed under, would tend to make the soil more open and loamy and increase its value. In the more level areas open ditches from 4 to 8 feet deep are necessary to remove the surplus water. Land of this type of soil has a value of $10 to $40 an acre.

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

Mechanical analyses of Oktibbeha 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.*
19010, 19012.....	Soil.....	0.0	0.6	0.7	11.3	18.7	57.1	11.2
19011, 19013.....	Subsoil.....	.0	.7	.5	7.1	16.4	44.9	30.1

OKTIBBEHA CLAY LOAM.

The Oktibbeha clay loam consists of a brown to reddish-brown silty clay to clay loam 9 inches deep, grading into a heavy, plastic, mottled red, yellow, and gray clay. The brighter mottling of the subsoil decreases with depth, owing to less aeration and oxidation. Over the comparatively level areas is found a somewhat more loamy surface soil, with an appreciable amount of silt, and here it often approaches a decided gray in color. This soil possesses many of the characteristics of both the clay and the silt loam members of the series, representing as it does a material slightly heavier than the silt loam and lighter than the clay. It is cultivated with more or less difficulty, being quite heavy and sticky when wet and hard when dry. When broken in clods, some difficulty is experienced in pulverizing them.

The Oktibbeha clay loam is found in areas of varying sizes, but always in connection with the other Oktibbeha types. There are several areas about 8 miles south of Nettleton, several about 6 miles west of Aberdeen, and several south of Aberdeen, west of the Tombigbee River, all of which are closely associated with the prairie or limestone soils. The topography varies from rolling to level, with drainage fairly good, though some of the more level areas need to be drained. The soil being fine-textured and compact, moisture percolates through it very slowly; hence the need of supplying arti-

ficial outlets for excess rainfall, otherwise the soil will maintain a cold, clammy nature for days at a time.

The Oktibbeha clay loam is derived from the same material and through the same processes of formation as the Oktibbeha clay and the Oktibbeha silt loam. There have been modifications in local areas through the action of erosion, transportation of soil material, and the deposition of later material, like the Lafayette, thin mantles of which are yet in evidence on some of the higher elevations.

The agricultural value and crop yields of this soil are about the same as for the Oktibbeha clay, and the recommendations for that type will apply to this one. A good mechanical condition of the soil is a prime requisite for good crop yields, and this must be brought about through deep plowing and the incorporation of organic matter, by means of applications of stable manure or the plowing under of deep-rooted cover crops. The timber growth is chiefly hardwood and much of the type is as yet uncultivated. It has a value of $8 to $30 an acre.

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

Mechanical analyses of Oktibbeha clay loam.

Number.	Description.	Fine gravel.	Coarse sand.	Medium sand.	Fine sand.	Very fine sand.	Silt.	Clay.
		Per cent.	*Per cent.*	*Per cent.*	*Per cent.*	*Per cent.*	*Per cent.*	*Per cent.*
19008	Soil	0.0	1.3	1.3	7.8	2.4	57.6	30.0
19009	Subsoil	.0	.8	.9	7.9	4.1	38.5	47.7

OKTIBBEHA FINE SANDY LOAM.

The soil of the Oktibbeha fine sandy loam is a grayish to grayish-brown fine sandy loam 6 to 10 inches deep, and underlain by a rather heavy plastic sandy clay of a light-brown to yellowish-brown color, which at lower depths is usually mottled. Usually the surface few inches of soil has a slightly darker color, on account of the presence of decayed organic matter, this condition being quite noticeable in the untilled areas and in those of lower lying position. A few years' cultivation will invariably decrease the humus content. The subsoil is less porous and less friable than the subsoil of either the Norfolk fine sandy loam or the Orangeburg fine sandy loam, though it approaches the general character of the Norfolk subsoil, more especially in the more elevated and better drained areas. The mottling of the subsoil has not as great a proportion of red as is found in the heavier members of the series, the general scheme of mottling consisting of gray, yellow, and brown or reddish brown.

Being a light soil and with usually good natural drainage, it is handled easily in cultivation. When very wet, however, the plastic nature of the upper subsoil render plowing, where the surface material is shallow, undesirable at such times, though the type as a whole is capable of cultivation over a wide range of moisture conditions.

This soil is found in one small area in the southwestern part of the county, along the Clay County line, being continuous with larger bodies extending into that county. It occurs in close relation to the prairie sections of the country, and, like the heavier members of the series, is probably derived in a large measure from the clayey deposits of the upper strata of the Selma Chalk formation. This type appears to be less distinctly derived from this source, however, than the heavier members, and it is quite likely that the Yellow loam formation has had an influence in determining the character of this individual area.

The topography of the type is gently rolling and natural drainage conditions are usually good, though local depressed spots may require artificial drainage, open ditches being satisfactory. Though a large percentage of it is still uncultivated, some fields are used for the cultivation of cotton of which fair yields are obtained. Like all soils of this general nature, there is need of organic manures to maintain productiveness, as the virgin fertility is soon reduced by the continued growing of clean-culture crops. The type responds readily to fertilizers, and with the addition of green or stable manures and a plan of crop rotation the soil can be made quite productive.

OCKLOCKNEE LOAM.

The Ocklocknee loam varies more or less widely in texture, structure and drainage features. The surface material ranges from a rather heavy sandy loam to a clay loam or clay, with a subsoil varying accordingly. These different characteristics, or phases, of the type occur so irregularly in varying sized areas that a detail separation was impossible. Certain small areas possess the characteristics of Meadow, but the agricultural value of the larger proportion of the soil forbids its correlation as Meadow. The character of the soil depends largely on the material of the surrounding elevations and of the region through which the streams have flowed, and the color is influenced largely by the color of the geological formation supplying the soil material, or by conditions of drainage and aeration. The presence of more or less organic matter in places imparts a darker color to the surface material. The surface soil of the lighter or sandy phase ranges in color from gray to yellowish-brown, and the subsoil from brownish to mottled gray and brown, while the heavier silty or clayey phase varies from gray to grayish-brown in the surface soil, and from brownish-gray to mottled gray and yellow in the

subsoil. Cultivation is comparatively easy, especially in case of the sandier phases. The heavier phases can not be cultivated over such a wide range of moisture conditions, though any clods that may form are quite easily reduced with a light harrow. Ordinarily the soil breaks into good tilth, possessing the nature of a mellow loam.

The Ocklocknee loam occurs as marginal strips of varying widths along the many small streams of the area, with the exception of those flowing out of the prairie or limestone areas. The topography is usually level and the natural drainage inadequate. Artificial drainage is generally provided by open ditches. The stream channels are usually deep enough to afford a ready outlet for all necessary secondary ditches. Over the heavier phases, which occupy the level to depressed areas, a complete system of drainage should be established. The main ditch should run with the lowest contour and the secondary ditches should finger off in needed directions and at necessary intervals. Good drainage means increased crop yields.

This type of soil is a reworked material washed from the surrounding elevations through the action of surface waters or taken into suspension by the stream waters, transported, and deposited during seasons of overflow. Much of it is still subject to inundation and the planting of crops is often delayed on this account.

Like all bottom soils that receive continually wash material from the broad upland areas and frequent alluvial deposits, it is when well drained and properly handled very productive. Cotton and corn are the staple crops, and the yields are usually good, cotton producing from ½ to 1 bale and corn from 30 to 60 bushels to the acre. Oats, sorghum, melons, etc., give good returns. The soil carries a value of $10 to $30 an acre.

LUFKIN CLAY.

The soil of the Lufkin clay consists of a dark-grayish to brownish gray clay loam from 2 to 4 inches deep, containing a rather high content of silt. This material is underlain by a more yellowish or brownish subsoil to a depth of 10 to 12 inches, when it becomes a mottled gray and yellow or brown clay, which is clammy, heavy, tenacious, and impervious in character. A small proportion of the type where it adjoins a stream bottom may have a slight covering of transported material. In general, the type grades into other soils, chiefly the Oktibbeha and Houston series, without any clearly defined boundaries, though the gradation zone is not very broad. The more level silty areas show the grayer color, while in the better drained gentle slopes or knolls the color is a yellowish-brown. Very little of the type is under cultivation on account of its refractory and obdurate nature.

The Lufkin clay is found only in three or four areas, chiefly to the west of Aberdeen, and in connection with the "flatwoods" and the "post-oak" lands. The topography is very gently rolling to flat, and drainage is usually very poor. The soil being of fine texture and compact, water moves through it very slowly and frequent drainage lines will be necessary for profitable cultivation. The cold, clammy, sticky, compact nature of the soil is induced, partly at least, through its flat topography and inadequate drainage.

Occupying about the same relation to the Houston clay formation as the Oktibbeha soils, it doubtless represents a derivative material from the argillaceous deposit on top of the Selma Chalk, the Lufkin characteristics being the result of its low-lying position and inadequate drainage.

By far the greater part of this soil is covered with a timber growth of hardwood, which constitutes its chief value. Development of the areas for agriculture is in general hardly practicable at the present time, as there is an abundance of good soil that can be prepared for profitable cultivation with much less expense.

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

Mechanical analyses of Lufkin 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.*
19032	Soil	0.0	1.9	1.6	8.6	6.4	44.0	37.3
19033	Subsoil	.2	1.0	1.3	6.5	9.3	36.8	44.4

LUFKIN SILT LOAM.

The soil of the Lufkin silt loam consists of a rather heavy gray silt loam 6 to 8 inches deep, containing very little sand larger than fine sand. The subsoil from 6 to 15 inches is a yellowish material, heavier in texture and structure than the overlying soil, while the remaining depth to 36 inches is usually a mottled gray and yellow silty clay. Both the texture and color of the subsoil show variations usually dependent upon topography, the more level areas having the grayer coloring and the gently rolling areas the yellower phase. At lower depths the subsoil is invariably a stiff, heavy, plastic mottled clay. The surface material for a few inches shows a slightly darker color than that beneath, owing to the presence of varying amounts of decayed organic matter. Areas of this soil grade almost imperceptibly into other soils, though the lines of separation can be fairly well drawn.

The Lufkin silt loam is found to the west of Aberdeen in areas of varying sizes and always in connection with other Lufkin soils or with the Oktibbeha series, which is also true of a single area about 5 miles west of Nettleton. The areas immediately around Amory, largely to the east and southeast of the town, occur chiefly in connection with the Cahaba silt loam. Owing to its rather limited extent the type is of little importance in the agriculture of the county. The topography varies from very gently rolling to comparatively level, with drainage fairly good over the more rolling stretches. In the depressions or more level areas where drainage is often sluggish open ditches are needed. These latter areas are usually more silty than the typical soil.

To the west of the Tombigbee River the soil appears to be a derivative from the formation giving the clay member of the series, probably influenced by some later deposit or transported material, while the areas around Amory appear to be derived from the formation giving the Cahaba silt loam, though such areas have been so influenced by moisture conditions that they possess the distinguishing characteristics of the Lufkin soils.

A part of the Lufkin silt loam is under cultivation and the yields of crops are fairly good. Cultivation can be carried on over a fairly wide range of moisture conditions, although when plowed too wet the soil tends to break into clods. These clods can be easily pulverized, however, by light harrowing, and as a whole the type may be readily put in good tilth. On account of the moisture-absorbing capacity of the clay subsoil and its rather impervious nature, drainage is necessary to secure good crops. Under good drainage conditions it is a desirable soil for general farming crops. Complete drainage, deep plowing, and the incorporation of organic matter in the form of barnyard or green manures are recommended. Cotton and corn are the chief crops grown, corn being confined largely to the lower lying areas.

The principal timber growth is hardwood on the areas to the west and pine on those to the east. The type has a value of $5 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 Lufkin 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.*
19028	Soil	0.4	0.4	1.2	13.5	17.5	59.5	7.2
19029	Subsoil	.2	.3	.9	10.8	11.1	44.9	31.7

MYATT FINE SANDY LOAM.

The Myatt fine sandy loam consists of a light-gray fine sandy loam 6 to 10 inches deep, underlain to a depth of 36 inches or more by a mottled yellow, gray, and drab heavy fine sandy loam or sticky sandy clay. The suface soil usually contains varying amounts of silt, and the color ranges from a dark-gray to yellowish. The first few inches of soil are usually darker than the material below, on account of the presence of some decayed organic matter in the former. The upper subsoil is usually a yellowish sandy clay, passing into a heavier mottled gray and yellow clay at lower depths. This soil is cultivated with more or less difficulty on account of excessive moisture. The more rolling areas are better drained and more easily handled.

The type occurs in a few small areas in the vicinity of Aberdeen and Amory, to the east of the Tombigbee River, its entire extent being approximately 3 square miles. The topography is usually quite level and the drainage very poor. It occurs in connection with the Lufkin silt loam and Norfolk fine sandy loam, probably being derived from the same formation as the Norfolk type, and represents the depressed and poorly drained areas.

Very little of this type is given to cultivation, these areas being first drained by a system of open ditches. Cotton is the chief crop, and fair to good yields are produced. Like all sandy soils, there is generally a deficiency of organic matter. A rotation of crops, including a leguminous cover crop, preferably cowpeas, plowed under every two or three years, would conduce to increased crop yields.

The standing timber growth consists chiefly of pine, with some hardwood. The type has a value of from $5 to $20 an acre.

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

Mechanical analyses of Myatt 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.*
19026	Soil	0.0	0.5	1.6	60.1	7.9	19.0	10.7
19027	Subsoil	.0	.1	1.3	46.5	6.4	17.9	27.8

ORANGEBURG FINE SANDY LOAM.

The soil of the Orangeburg fine sandy loam consists of 8 to 14 inches of gray sandy loam, in which the sand content consists largely of the grade of fine sand. The subsoil, to a depth of 36 inches or more, is a red to brownish-red sandy clay. The clay stratum varies in thickness, as is evidenced in road cuts, where a substratum of sand, or sometimes of sticky bluish clay, may be seen. Iron concre-

tions are often found scattered over the surface soil and in the subsoil, and in the northeastern part of the county ferruginous masses were found on some of the hills. A few small areas of the type, too small to indicate on the map, show a rather high percentage of rounded gravel, and seams of gravel from 3 to 6 feet thick often outcrop on the slopes of many escarpments. The surface of large fields of the Orangeburg fine sandy loam show spots of a reddish to brownish color, the result of an admixture of material from the subsoil, which has been partially exposed by erosion. Such areas, when large enough, were mapped as the Orangeburg clay, though many small areas of the clay loam, and in one or two instances the sandy loam, were included in the fine sandy loam type. As the latter soil is of loose structure, it is easily handled and permits cultivation over a wide range of moisture conditions.

The Orangeburg fine sandy loam occurs uniformly in the eastern half of the county, where it occupies mainly the rolling to hilly divide extending across the county from north to south and separating the Tombigbee Valley from that of the Buttahatchie River. Over this broad expanse may be found small areas of various soil types, a great many of which were too small to show on the map. In the northern part of the county, in the forks of the Tombigbee River and Old Town Creek, are a few square miles of this soil, which is probably a continuation of that developed extensively in Itawamba County. To the west of the river, a few miles south of Aberdeen, the type occurs in a narrow strip of rolling country that flanks the river and extends to the southern boundary.

The topography varies from rolling to hilly, with drainage at all times good. While the soil is loose and open, permitting a ready absorption of rainfall, the surface is liable to damaging erosion, and in tilling care must be exercised to prevent washing.

The Orangeburg fine sandy loam is derived from the Lafayette sands and clays, deposits of Quaternary time. Local agencies of modification or an admixture of certain amounts of later deposits may have influenced the color of some areas of the type, still its greater extent is characterized by the red coloring of the Lafayette formation. The hilly topography of much of this soil, especially in parts of the divide, lowers its agricultural value. As a rule, it is a good soil and is cultivated in the staple crops, cotton and corn, with fair to good returns. Cowpeas, oats, sorghum, vegetables, and the usual farm crops are grown for local needs. The type is easily handled, responds readily to fertilizers, and is susceptible of great improvement. The sandy clay subsoil readily absorbs moisture and retains it for the growing crops.

This type of soil is well adapted to fruits, berries, grapes, etc., peaches doing remarkably well. Probably a good grade of tobacco could be

grown on favorable areas. Truck crops would be profitable where the type is convenient to transportation facilities, and probably the more hilly areas could be best utilized in the production of fruits. The yield of cotton is from one-third to three-fourths of a bale to the acre, and of corn from 12 to 40 bushels, according to soil conditions and management. Adequate tillage methods and the use of winter cover crops to prevent washing, together with a systematic plan of rotation, including a cover crop, preferably a legume, to be plowed under every two or three years, would make this a stronger and more productive soil.

Much of the Orangeburg fine sandy loam type supports a timber growth of hardwood and shortleaf pine, which constitutes the chief value of certain very broken areas. The type ranges in value from $3 to $25 an acre, according to improvements or the quality of the standing timber.

The following table gives the average 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.*
19042, 19044.....	Soil.....	0.4	3.6	4.2	52.2	8.7	24.4	6.1
19043, 19045.....	Subsoil.....	.1	2.1	3.3	37.1	6.4	17.7	33.4

ORANGEBURG CLAY.

The Orangeburg clay is a brown to reddish-brown clay loam to sandy clay 6 inches deep, underlain by a reddish-brown to red sandy clay subsoil 36 inches or more deep. The sand content is chiefly of the finer grades, though occasional areas were encountered which showed a predominance of the coarser grades. The sand content varies; where the percentage is high the soil material is quite friable and where low it is sticky. In the more loamy areas there are appreciable amounts of silt mixed with the sand and clay. The type is less easily handled than the Orangeburg fine sandy loam, though when cultivated at the right moisture content it assumes a good tilth.

The Orangeburg clay does not occur extensively nor uniformly in this county, only a few square miles being mapped. It is found only in small areas and at irregular intervals in connection with the fine sandy loam type. The origin of the two soils is the same, both being derived from the Lafayette formation. The occurrence of the clay is due, in the main, to the action of erosion in transporting the sandy surface material and exposing the underlying sandy clay

stratum. The coarser sand particles being less easily moved have remained and thus constitute a larger percentage of the sand content than they do in the sandy loam type.

The topography of the Orangeburg clay is rolling, though several small areas of the more loamy phase were found with a gently rolling surface. Ordinarily it is developed only where erosion is active. Drainage is at all times good.

This type of soil is cultivated chiefly in cotton and corn and fair to good yields are produced. It is a strong soil and when handled properly gives satisfactory returns. It has about the same value as the Orangeburg fine sandy loam.

NORFOLK FINE SANDY LOAM.

The soil of the Norfolk fine sandy loam is a gray to brownish-gray sandy loam 8 to 10 inches deep, in some instances approaching a loam. The subsoil is ordinarily a yellow sandy clay, though occasionally it may have a marked silty texture and vary in color from a brownish gray to mottled gray and yellow. The presence of more or less decayed organic matter gives the first few inches of soil a slightly darker color than that immediately below, this being especially true in the lower lying areas where leaching is less active. On the upper slopes of the elevations the brownish colored material is generally in evidence, while the lower slopes usually show the phase with the deepest surface soil. Being a light soil, cultivation is carried on with little difficulty, except over areas where drainage is deficient. Ordinarily the soil can be plowed without bad effects over a wide range of moisture conditions.

The Norfolk fine sandy loam occurs chiefly over the undulating to rolling portion of the county between the usually broad and comparatively level terraces of the Tombigbee River and the more rolling to hilly divide of Orangeburg fine sandy loam to the east, where it is found at irregular intervals in areas of varying sizes. Occasionally the rolling stretches will extend almost to the river channel. In the northwestern part of the county in the vicinity of Nettleton and to the north of Old Town Creek several square miles were mapped.

Surface features of the type range from undulating to rolling, with drainage ordinarily good. The more rolling areas have excellent natural drainage and the soil is fairly productive. It is susceptible of great improvement. The lower lying areas may be deficient in drainage, and in such cases open ditches prove satisfactory and less costly than tile. Over these latter areas is found the heaviest phase of the type and more consistently the mottled yellowish subsoil. Such areas, however, represent a small acreage and are of little importance.

The Norfolk fine sandy loam is probably derived largely from the Columbia deposits of Quaternary time, with possibly some few small areas showing a percentage of material that obscurely indicates the individual area to have been remotely influenced by river action, such small areas occurring closely associated with the Cahaba fine sandy loam occupying the old river terraces. No doubt some of the type near the Orangeburg soils has been influenced by the Lafayette material, more especially where erosion has effected a removal of much of the overlying material. Such instances are evidenced by the brighter tint of coloring in the subsoil. The Lafayette sands and clays, however, can not be said to have contributed in any appreciable extent to the formation of this soil.

Though the larger proportion of the type is still unreclaimed to cultivation, it might be made one of the desirable soils of the area. It is easily handled, is well drained, has a wide range of crop adaptations, and shows a capacity for improvement. Being a friable soil, it can be handled at almost any time; and in the event of being plowed too wet, any resultant clods can be easily reduced by light harrowing. The type can profitably be devoted to the usual farm crops, care being exercised to maintain the fertility of the soil, which, being light, readily becomes impoverished of its organic content through indifferent and careless methods of cropping. Cotton, rye, cowpeas, and special crops, grown in rotation, with the cowpeas plowed under every two or three years, will do much to build up and maintain the productiveness of the soil. Some of the more level and heavier phases can be used for corn, though the type appears to be better adapted to cotton, peanuts, berries, melons, rye, cowpeas, truck crops, and probably certain varieties of tobacco. The usual method of fertilizing this soil is to apply commercial fertilizers, and their use is profitable. With fertilizers, used in connection with stable and green manures, and systematic rotation of crops there should be no difficulty in bringing this type of soil into larger account in the agriculture of the area. It has a value of from $10 to $20 an acre.

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

Mechanical analyses of Norfolk 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.*
19038	Soil	0.0	0.5	0.5	41.1	25.7	27.6	4.5
19039	Subsoil	.0	.4	.2	27.0	25.3	29.8	17.1

CAHABA SILT LOAM.

The soil of the Cahaba silt loam is a gray silt loam 8 inches deep, containing some organic matter and varying quantities of the finer grades of sand. The subsoil is a yellowish clay loam to a depth of 18 inches, where it grades into a yellowish sandy clay. Occasionally the lower subsoil has a mottled appearance, owing probably to deficient drainage or the presence of certain iron compounds which on oxidizing stain the surrounding material. The color of the surface soil may be yellowish-brown to yellowish-gray, depending generally on the topographic relief. The more level areas show the more grayish color, owing largely to the presence of a higher percentage of organic matter. The subsoil is sometimes a very sandy clay and again a very heavy clay. It may be reddish or a very light and generally mottled color. These conditions, however, are limited, and the type runs rather uniformly with the typical light-gray to yellowish-gray surface soil, underlain by the yellowish to brownish-yellow sandy clay subsoil.

This is a very desirable soil, as it combines with a rather friable texture sufficient compactness to maintain a good moisture supply. The heavier phases may break into clods which tend to bake on drying but these are broken up with little difficulty, except where the soil has been plowed when entirely too wet, in which case clods may bake very hard.

The type occurs chiefly to the east of the Tombigbee River, though a few limited areas are found on the west side a few miles north of Aberdeen. Its extensive occurrence is over the undulating to gently rolling country between the lower river bottoms and the rolling divide of Orangeburg fine sandy loam to the east. It extends across the entire county from north to south in areas of irregular outline broken by many areas of other types of soil. Beginning at the county line near Smithville, it runs practically parallel to the Tombigbee River throughout its course to the junction of the Buttahatchie River.

The surface features are characterized by an easy relief, many areas presenting a comparatively level topography. Drainage is ordinarily good, though inadequate in some cases in the more depressed areas. There is generally a rather abrupt escarpment of several feet from the higher elevations to the stream bottoms or lower elevations. These escarpments generally exhibit outcrops of a seam of rounded gravel several feet thick and from 6 to 20 feet below the surface. No doubt this gravel underlies much of the type and is a great factor in bringing about the good drainage conditions.

The Cahaba silt loam is probably derived from the yellow loam of the Columbia formation of Quaternary age. No doubt a part of it has

been transported from the adjacent hills and elevations which were at least partially covered by these deposits. Its very gentle surface precludes any severe erosion.

A wide range of crops may be grown on the Cahaba silt loam. It is easily managed, responds readily to fertilizers, has good drainage generally, and permits of the use of almost any kind of improved machinery. Some of the most progressive farming in the county is seen on this type of soil. Commercial fertilizers are used to some extent. A beneficial crop rotation and improved tillage methods are practiced and labor-saving machinery is used. Cotton and corn are the staple crops, though oats, rye, Irish and sweet potatoes, cowpeas, vegetables, fruits, etc., are successfully produced. Probably the lighter phases of the type would produce a good grade of tobacco. On an average, the soil will produce about one-half bale of cotton to the acre and from 20 to 35 bushels of corn, though yields of 1 to 1½ bales of cotton and 75 bushels of corn to the acre have been produced by some of the progressive farmers. The uncultivated areas support a timber growth of hardwood and pine. The type has a value of from $15 to $60 an acre, according to location and conditions of improvement.

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

Mechanical analyses of Cahaba 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.*
19034	Soil	0.2	0.8	2.2	13.9	5.4	67.0	10.6
19035	Subsoil	.3	.4	2.4	16.0	9.8	49.8	20.9

AMORY FINE SANDY LOAM.

The soil of the Amory fine sandy loam is a brown fine sandy loam 6 to 8 inches deep, often approaching the texture of a loam. It contains an appreciable percentage of silt and the sand content is mainly of the finer grades. The subsoil varies from a brown fine sandy loam to a sandy clay to a depth of 36 inches or more, but the color varies from yellowish brown to reddish yellow over local areas. The color of the subsoil, which also influences the surface appearance, was the distinguishing characteristic upon which its separation was based. In general, the type is quite similar to the Norfolk fine sandy loam and the Orangeburg fine sandy loam, but its color is too red to permit its classification with the Norfolk series and too dull to go with the Orangeburg soils. The surface material grades insensibly into

the underlying sandy clay subsoil, there being no marked line of separation. The Amory fine sandy loam is a fairly strong soil and is cultivated with little difficulty. The heavier phases may be too heavy to handle when very wet, though generally the soil is friable and readily put in good tilth.

This type of soil occurs chiefly to the east of the Tombigbee River in comparatively level to gently rolling areas between the river terraces and the hilly divide in the eastern part of the county. It appears in scattered areas of varying size throughout the zone of the Norfolk soil. Many areas too small to indicate were included in the Norfolk fine sandy loam. The largest area is found about 6 miles east of Aberdeen, between areas of Cahaba fine sandy loam and Orangeburg fine sandy loam. This area, while continuous except for stream-bottom areas, is not uniform, as it includes small spots of other soil types, chiefly Cahaba silt loam.

The topography is gently rolling to comparatively level and the drainage is generally good. The slopes are generally moderate and the soil rather porous, so that little, if any, damaging erosion takes place.

The soil is no doubt derived from a material that is, at least in part, contemporary with that giving the Norfolk soil, but which probably has a slightly different chemical composition as regards its iron content, or the soil may represent an admixture of more recent material with the Lafayette formation. There are no definite lines of separation between this and adjoining types.

The Amory fine sandy loam has about the same agricultural value as the Norfolk soil which surrounds it. Cotton and corn are the chief crops, while sorghum, oats, melons, and peas are grown in limited quantities.

With a proper system of crop rotation and improved tillage methods this soil can be brought to a high state of productiveness. On the lighter phases, especially in the southern part of the county, the trucking industry might be made very profitable. Land of this type of soil has a value of from $10 to $30 an acre.

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

Mechanical analyses of Amory 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.*
19014	Soil	0.0	1.3	8.5	42.4	5.4	37.0	5.3
19015	Subsoil	.1	.7	5.5	30.0	6.4	36.3	21.3

GUIN FINE SANDY LOAM.

The soil of the Guin fine sandy loam consists usually of a gray fine sandy loam 6 to 15 inches deep. The color of the shallowest phase, found generally on the upper slopes, is usually influenced by admixture with the underlying brownish clay. The presence of varying quantities of organic matter gives the first few inches of the soil a usually darker color than the underlying material. The subsoil is usually a yellowish-brown to yellowish-red sandy clay, though it may be almost any shade between red and yellow. The texture of the subsoil is also variable, ranging from a rather heavy clay to a very sandy clay, the heavier phases generally showing the reddish-brown color.

Areas of the Guin fine sandy loam are not uniform, as they include many spots of material showing different characteristics, but too small to indicate in the map. Small spots of Orangeburg material, more or less typical, or of Norfolk material may be frequently encountered. There appears to be no regular system of occurrence of these soils; they may develop on the crests of slopes of the hills, ridges, or over the more level areas. Generally, however, the material is of brighter color on the slopes, where a better aeration and oxidation is possible. The deepest soil is found on the lower slopes and in the narrow valleys. In some of the hills in the northeastern part of the county there occur small fragments and larger masses of ferruginous sandstone. Little of the type is under cultivation, though it is easily tilled.

The type occurs in the northeastern part of the county on eacn side of Splunge Creek and is the prevailing soil over the territory east of the Buttahatchie River. The topography is rolling to very hilly, the areas consisting of irregular ridges interspersed with narrow V-shaped valleys. Drainage is at all times good, the run-off being so rapid that erosion is severe.

The Guin fine sandy loam is probably derived from an intermingling of material of the Lafayette formation with some later deposits. The color of the subsoil is similar to that of the Amory fine sandy loam, being intermediate between the Norfolk and the Orangeburg. Probably in the northeastern part of the county the Tuscaloosa has entered into the formation of the soil.

Owing to the very rough topography, there are large areas upon which farming is impracticable and have the chief value of the land in the forests of hardwood and pine. In fact, the agricultural value of the soil as a whole is low, and the greater part of it remains in forests. The areas under cultivation are usually in the less rolling stretches, but even these are invariably subject to more or less severe erosion. Very probably fruits could be produced extensively on the

hills and ridges, but the distance to convenient market facilities is a great handicap. The valley and lower lying areas, where sufficiently broad to justify cultivation, are given to cotton and corn with good returns. Commercial fertilizers are used. The region occupied by the Guin fine sandy loam is the most thinly settled part of the county, and until much more of the other farm lands is utilized the chief value of the type will continue to be the timber growth. At present it carries a value of from $2 to $20 an acre, depending largely on the character of the forest.

SUSQUEHANNA FINE SANDY LOAM.

The soil of the Susquehanna fine sandy loam consists of a gray to light-brown fine sandy loam, ranging in depth from 6 to 10 inches. The subsoil to a depth of 3 feet or more is a plastic red clay, containing considerable quantities of partially decomposed shale. Throughout the soil section are also found frequent deposits of fine quartzite gravel, and in the lower strata limestone fragments are occasionally encountered. Where the sandy material completely covers the stiff clay subsoil, the type is friable and easily handled, but where the heavy subsoil approaches the surface the material when wet is very sticky and plastic, making cultivation difficult.

Only a few small areas of the type are developed. These are found in the eastern part of the county. The areas are often so small that it was impracticable to show them on the map.

The type has a very hilly topography, being found only on the steep slopes in the rougher portion of the area. On account of this hilly condition the drainage of most of the areas is excessive and erosion has taken place to a damaging extent.

None of the type is under cultivation, the entire soil body being covered by a growth of red oak, post oak, black-jack oak, and hickory, and the growth of this native timber is probably the best utilization of the type.

The value of the Susquehanna fine sandy loam ranges from $3 to $7.50 per acre.

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

Mechanical analyses of Susquehanna 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.*
19046	Soil	2.1	1.7	2.0	18.0	26.5	40.6	8.8
19047	Subsoil	.0	1.1	.8	5.0	6.4	49.8	36.8

OCKLOCKNEE CLAY LOAM.

The Ocklocknee clay loam consists usually of a dark grayish-brown to brownish clay loam 6 to 12 inches deep underlain by a lighter brown clay subsoil, usually quite heavy and plastic and occasionally mottled with iron stains at lower depths. The surface material carries in general an appreciable amount of silt, more especially in level and depressed areas. The gentle swells or better drained areas along the stream channels show the lightest phase of the type, with a sand content including all the grades, but with the finer predominating. The subsoil is usually a stiff, tenacious, light-brown to yellowish-brown clay, often mottled at lower depths and occasionally light gray in poorly drained areas. Some depressed areas were encountered in which a very dark-gray to almost black surface soil occurred. Cultivation is carried on with difficulty on account of the heavy nature of the soil, the unfavorable moisture conditions, and the frequent inundations.

This soil forms the first bottoms along the courses of Old Town Creek and the Tombigbee River. It is not continuous at all times along the stream channels, being broken by areas of other bottom types. Occasionally the stream channel has been cut deep enough to accommodate all rainfall, and where this is the case the soil lies above overflow. As the river bottoms are so thinly settled and support such a luxuriant growth of timber and underbrush, a detail traverse was considered impracticable. The lines of separation between the three divisions of these bottom soils were usually very indistinct, though in some instances there are well defined terraces.

The topography varies from comparatively level to flat, with drainage usually sluggish or poor. Numerous old sloughs traverse the type. These hold water for weeks or months after overflows and much of the rainfall drains into them. During the summer overflows are seldom and the soil becomes well drained, though not until long after the planting season. The river channel is usually deep enough to permit a good fall for artificial drains. Deep canals or broad ditches leading to the river channel would adequately drain large areas of this soil and fit them for profitable cultivation. There would of course be danger of overflow, but these occur only in the wet seasons of the winter or late spring. Occasional damage to crops might be expected, but as the soil is very fertile its use for certain crops would give good returns.

The soil is largely alluvial in origin, having been deposited by the river during seasons of overflow. As the heavier soil particles carried in suspension are the first to be deposited, the land along the river front has usually a loamy nature, often approaching a sandy loam, while the finer particles are deposited from the slow-moving

or stagnant waters over the broad low-lying stretches farther away from the stream. The dark-grayish color of the soil, especially in certain areas, and its heavy nature are no doubt in part the result of material washed from the black-prairie (Houston) soils.

Practically all of the Ocklocknee clay loam is in forests, the timber being chiefly gum, and numerous lumber enterprises are located along the river. With the deforesting of this soil and the installation of good drainage systems, it will be found to be very productive. The yearly addition of an alluvial deposit is a guarantee of sustained fertility. The value of the type ranges from $5 to $20 an acre, depending largely on the grade of standing timber.

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

Mechanical analyses of Ocklocknee clay loam.

Number.	Description.	Fine gravel.	Coarse sand.	Medium sand.	Fine sand.	Very fine sand.	Silt.	Clay.
		Per cent.	*Per cent.*	*Per cent.*	*Per cent.*	*Per cent.*	*Per cent.*	*Per cent.*
19052, 19054.....	Soil.....	0.1	1.9	2.1	23.2	9.1	38.1	25.2
19053, 19055.....	Subsoil.....	.0	.4	1.4	27.6	11.6	26.1	32.5

CAHABA LOAM.

The Cahaba loam consists of a gray light loam 4 to 10 inches deep, often approaching a fine sandy loam in texture underlain by a brownish to mottled yellow and gray heavy fine sandy loam to clay loam. The darker gray surface soil and the mottled subsoil are generally found in the lower lying to level areas. Most of this soil is under cultivation and is readily kept in good tilth.

This is a second bottom soil found along the Tombigbee River. It represents the oldest of the broad bottoms that bears evidence of alluvial origin and is no longer subject to overflow. The largest areas occur in the northern part of the county near the junction of Old Town Creek and the river. The topography is gently rolling or undulating to level, and the heavier phases of the soil are found in the lower lying areas, where the silt content is quite appreciable. The gentle swells are more loamy, owing to the transportation to lower levels of a part of the original silts and clays. Drainage varies from good to poor, according to topography, the low areas demanding rather extensive ditching.

The cultivated areas are used chiefly for cotton and corn, cotton yielding about one-half bale and corn from 25 to 50 bushels to the acre. Good drainage, deep plowing, crop rotation, and the addition of organic matter would build up a strong soil adapted to a wide variety of crops. Large areas are still in original forests, the timber

growth being largely hardwood with a sprinkling of pine. The land has a value of from $5 to $30 an acre.

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

Mechanical analyses of Cahaba 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.*
19048	Soil	0.0	0.6	2.2	50.3	9.9	20.0	16.7
19049	Subsoil	.0	.1	1.5	35.5	7.9	18.9	35.7

OCKLOCKNEE SILT LOAM.

The soil of the Ocklocknee silt loam consists of a dark-grayish to yellowish-gray silt loam about 9 inches deep. The subsoil is a yellowish heavy loam grading into a rather heavy mottled gray and brown clay loam at lower depths. The dark color of the first few inches of surface soil is influenced by organic matter, the color becoming a rather light gray on thoroughly drying. The lighter phase of this soil occurs on the higher swells, where the material often approaches a fine sandy loam in texture, while the heavier phase is confined to the depressions and lower lying areas. Over the more level to depressed sections the subsoil has a grayer mottling than elsewhere. The larger proportion of the type is unimproved, but cultivated areas are friable and easily kept in good tilth. The heavier phase may break into clods when plowed, especially if plowed too wet, but these can be broken down without much difficulty with a light harrow. Some areas of the type approach the character of Meadow.

The Ocklocknee silt loam occurs as first bottom land and occupies the lower depressions of the valleys of Buttahatchie River, Sipsie River, and Splunge Creek. The boundary lines between this and the other bottom land type are often indistinct, especially in the Buttahatchie River Valley, and separations are necessarily arbitrary, except when distinct terraces occur. Many spots of undifferentiated material too small to map are included in the type. The topography is approximately level, with depressions or swells appearing at irregular intervals. Old sloughs are numerous. Drainage is a necessary prerequisite in cultivating most of the type, and valuable areas have been reclaimed to profitable agriculture through a system of canals or ditches leading into the river.

This soil represents in part material washed from adjacent slopes and in part that transported by the river and deposited during floods. It includes practically all of the present overflow land of the Buttahatchie drainage system. Many depressions or sloughs at

higher levels, representing old drainage lines of the valley which remaining for years in swampy condition or covered with water, have been filled up through natural agencies sufficiently to be artificially drained and reclaimed to profitable cultivation.

The greater proportion of the type is in standing timber Where cultivated the yields are usually good, corn producing from 30 to 60 bushels and cotton from one-half to three-fourths bale to the acre. Commercial fertilizers are used. This is naturally a strong soil. A part of it is enriched annually by alluvial deposits. If properly drained and cultivated the soil would prove one of the strongest soils of the county. Crops might be occasionally damaged by floods, but the overflows occur only during seasons of excessive rainfall, and rarely during the growing season. The type has a value of $5 to $25 an acre.

CAHABA FINE SANDY LOAM.

The Cahaba fine sandy loam is a grayish fine sandy loam 6 to 12 inches deep, underlain by a yellowish to brownish sandy clay subsoil, which in many instances is mottled. The surface soil at times has a brownish tinge and is usually slightly darker in the first few inches on account of the presence of a larger quantity of decayed organic matter. The sand content is of the finer grades, and there is usually an appreciable amount of silt in both the soil and the subsoil. The color of the surface material is often determined by the position of the area, the lower levels and depressions invariably showing the darker gray color, while the more elevated areas and gentle slopes usually present the brownish coloring, leaching in this position being more rapid. The lower areas also have a higher content of silt. Except in areas where drainage is deficient, cultivation is comparatively easy, and the average yields are satisfactory, though they could be greatly increased by incorporating in the soil organic matter in the form of stable and green manures. The type is a rather loose and friable soil and can be plowed under a wide range of moisture conditions.

This type of soil occurs in irregular-shaped areas of varying sizes throughout the comparatively level country adjacent to the Tombigbee and Buttahatchie rivers and Old Town Creek. Along the Tombigbee River it occurs closely associated with the Norfolk fine sandy loam, Cahaba silt loam, and Amory fine sandy loam, these types occupying largely all the level to undulating country between the river and the hilly divide of Orangeburg fine sandy loam to the east. In the Buttahatchie River valley it occurs on some of the higher terraces which are usually adjacent to the uplands. Along Old Town Creek the small areas are found upon the oldest terraces of the valley lands.

The surface features of the type range from level to undulating or very slightly rolling, and drainage is usually fair to good. Some lower lying areas are deficient in drainage, but that condition can usually be relieved by means of open ditches, the soil being sufficiently porous to permit a rather free percolation of water. While in some cases the type may occupy the high terraces immediately adjacent to the streams, its occurrence quite uniformly marks the outer edge of the valley lands.

While the material constituting this type of soil has many similarities of the Norfolk fine sandy loam, its position, its manner of formation, and its consequent agricultural value forbid its correlation with the Norfolk series. In a great many instances its separation from the Norfolk soils was quite arbitrary. The type, occurring as it does over the broad flats flanking the larger stream courses of the area, no doubt represents material that was subjected to river action in remote time, but which to-day so obscurely retains the characteristic evidences of reworked material as to make it a difficult matter to locate boundaries definitely. The river flats are often 4 or 5 miles wide and there are in general well-defined terraces to mark the older and the younger river deposits. Still this type occupies the position, quite clearly marked in some instances, of the oldest river terraces. It occurs over the higher swells and knolls of the valley lands and is always beyond the reach of overflow waters. When occurring immediately adjacent to the uplands the type represents reworked material—the wash from the surrounding elevations mixed with old alluvium.

A large portion of the type is still uncultivated, though it is a very desirable soil. It is a light, friable soil, easily handled, retentive of moisture, responds readily to fertilizers, offers possibilities for a wide diversification of crops, and when rightly handled is of high producing capacity. Like all the sandy soils of the area, its fertility depends in a great measure on maintaining the supply of organic matter. In the absence of stable manure, a leguminous cover crop, preferably cowpeas, plowed under every two or three years, is recommended. Yields are ordinarily fair to good, averaging about one-half bale of cotton and from 20 to 40 bushels of corn to the acre. Much larger yields have been produced by progressive farmers. In addition to the usual farm crops of cotton and corn, hay, oats, cowpeas, rye, and special crops could no doubt be grown very profitably. The type, in part at least, could be used for truck crops, peanuts, berries, melons, and probably for tobacco. Stable and green manures receive a ready and lasting response from this soil, and if liberally used will bring the type to a high state of productivity. Commerical fertilizers are largely used and with paying returns. The type has a value of from $10 to $30 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 Cahaba 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.*
19016, 19050.....	Soil.....	0.0	0.8	2.2	35.8	21.2	34.4	5.2
19017, 19051.....	Subsoil.....	.1	.2	.6	17.7	16.1	41.7	23.1

SUMMARY.

Monroe County lies in the northeastern part of the State of Mississippi in the first tier of counties along the Alabama line and about 65 miles south of the Tennessee border. It comprises 487,040 acres, or 761 square miles. The topography ranges from rolling to undulating or comparatively level. The two principal drainage lines are the Tombigbee River, flowing across the central portion of the county from north to south, and the Buttahatchie River flowing in the same general direction through the eastern part and emptying into the Tombigbee at the southern edge of the county.

The settlement of the area is fairly general, more marked, however, over the more productive soils and in the neighborhood of the railroads and towns. A large part of the area is under cultivation and yields range from fair to good. The timbered hilly sections in the east and the low-lying, poorly drained areas in the valleys of the larger streams represent the lands of lowest agricultural value at present.

Aberdeen, with about 5,000 inhabitants, near the center of the county, is the county seat, and the most important town of the county, while Amory in the north with a population of 1,500, is a thriving business place.

Four systems of railroads operate in the area; the Frisco, in the northeastern section, the Mobile and Ohio in the western, the Illinois Central in the southern, and the Aberdeen and Tombigbee Valley, which crosses the central part in a northwest and southeast direction. Ample transportation facilities are convenient to all sections. Rural mail delivery routes and telephone lines are universal.

Climatic conditions are favorable to a diversified agriculture. The winters are mild and short and the summers long and comparatively hot. The rainfall is well distributed throughout the year, with the highest average during the late winter months.

Cotton and corn are the staple crops grown, with oats, wheat, sorghum, melons, peanuts, potatoes, vegetables, fruits, berries, cowpeas, alfalfa, Johnson grass, melilotus, etc., produced in sufficient

quantities to meet local needs. The introduction of alfalfa in the black prairie region and its successful culture bids fair to make it one of the staple crops of the limestone section. Commercial fertilizers are used extensively on the lighter sandy soils. No general system of crop rotation is largely practiced and little recognition is given to the adaptation of soils to crops. Negro labor is largely used and proves satisfactory under supervision. The monthly wage is about $15.

Twenty-two types of soil were established in the area, varying in texture from sandy loams to clays. Large areas still support a forest growth of hardwood and pine.

The Houston clay is probably the strongest upland soil of the area for general farming purposes. Cotton, corn, and forage crops are the chief products, cotton yielding from one-half to three-fourths of a bale and corn from 30 to 75 bushels to the acre. Johnson grass, alfalfa, and melilotus are the chief forage crops, with yields ranging from 3 to 6 tons to the acre. The type has a value of $20 to $50 an acre.

The Houston chalk represents exposures of the limestone formation, resulting largely from erosion. The growing of melilotus is the most profitable utilization of these areas, as well as the best method of reclaiming them to cultivation.

The Trinity clay is a black heavy bottom soil of the prairie areas, and is subject to overflow. It is a strong soil for cotton, corn, and forage crops, cotton producing from one-half to 1 bale, corn from 40 to 75 bushels, and hay, chiefly Johnson grass, from 3 to 6 tons to the acre. It has a value of from $25 to $60 an acre.

The Oktibbeha clay loam is a somewhat lighter soil than the clay, and slightly more friable, though its agricultural value and possibilities are about the same.

The Oktibbeha silt loam where well drained produces fair to good crops. Drainage, deep plowing, and the incorporation of organic matter to modify its compact nature are necessary requisites for successful crop production on this soil.

The Ocklocknee loam is a productive soil found along the courses of the smaller streams. It is usually cultivated to cotton and corn with good results. Much of it is above average overflow, while portions of it are inundated frequently. It has a value of from $10 to $30 an acre.

The Lufkin clay, owing to its compact, impervious nature, and deficient drainage, is undesirable for farming, though when well drained fair to good yields of cotton and of corn are produced. Little of the type is under cultivation, the remaining areas supporting chiefly a growth of hardwood.

The Lufkin silt loam is well adapted to a variety of crops when thoroughly drained, and the value of the Myatt fine sandy loam as a farm soil depends largely on the efficiency of drainage. The greater proportion of the latter type is in timber.

The Orangeburg fine sandy loam, which is found in the rolling to hilly sections in the eastern part of the county, is adapted to a wider range of crops. It can be easily brought to a high state of productiveness. The soil is cultivated to cotton and corn as the staple crops, with oats, sorghum, vegetables, and fruits as supplementary crops. It has a value of from $5 to $30 an acre.

The Orangeburg clay appears in small areas, its occurrence being largely the result of erosion in removing the sandy surface soil and exposing the red sandy clay subsoil. It is a strong soil when properly handled, yielding from one-half to three-fourths bale of cotton and from 30 to 60 bushels of corn to the acre.

The Norfolk fine sandy loam is a desirable soil both for general and for special farming. It shows great capacity for improvement. On this soil corn yields from 30 to 60 bushels and cotton from one-half to three-fourths bale to the acre. Oats, wheat, sorghum, vegetables, melons, fruits, and forage crops do well and probably tobacco would be a profitable crop. This soil has a value of from $10 to $30 an acre.

The Cahaba silt loam is one of the desirable extensive soils of the area and is adapted to a wide diversity of crops. About the same crops are grown on this soil as on the Norfolk fine sandy loam, and good yields are obtained. It has a value of $15 to $60 an acre.

The Amory fine sandy loam is associated in origin and position with the Cahaba and Orangeburg soils, and has about the same agricultural value as the Cahaba fine sandy loam.

The Guin fine sandy loam is largely timbered with hardwood and pine. When cultivated it is devoted to the growing of cotton and corn with fair to good results. It has a value of $2 to $20 an acre.

The Ocklocknee clay loam represents the first bottoms and lower depressions of the Tombigbee River Valley. Much of the type is subject to yearly inundation and supports a heavy growth of gum and other hardwoods. Extensive ditching will be necessary to develop this soil.

The Cahaba loam occurs on the second bottoms or terraces. It is generally slightly elevated above overflow and some of it is cultivated in cotton, corn, and sorghum, all of which give satisfactory yields. Most of the type needs better drainage and a large part is still timbered in hardwood.

The Ocklocknee silt loam is an alluvial soil much of which is subject to overflow. Its timber growth is chiefly hardwood. The soil is naturally fertile and when cultivated good yields are obtained. Much of it needs draining. It carries a value of $5 to $25 an acre.

The Cahaba fine sandy loam represents the higher terraces of the river bottom. The type is cultivated chiefly to cotton with good results. Commercial fertilizers are used. Truck, peanuts, potatoes, and fruits would no doubt be successful crops. The type has a value of $5 to $25 an acre.

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