SOIL SURVEY OF FORREST COUNTY, MISSISSIPPI.

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DESCRIPTION OF THE AREA.

Forrest County is located in the southeastern part of Mississippi. It is bounded on the north by Covington and Jones Counties, on the east by Perry, on the south by Harrison, and on the west by Lamar and Pearl River Counties. It is approximately 36 miles in length and 12 miles in width, having an area of 460 square miles, or 294,400 acres.

Leaf River enters the area about midway on the north line and leaves it some 15 miles below the northeast corner. Bouie River comes into the county at the northwest corner and flows southeastward into the Leaf. Black Creek, which is really a small river, has a southerly course across the south-central part of the area. Wall, Davis, and Poplar Creeks are tributary to it on the north, while it receives Little Black and Big Creeks from the southwest.

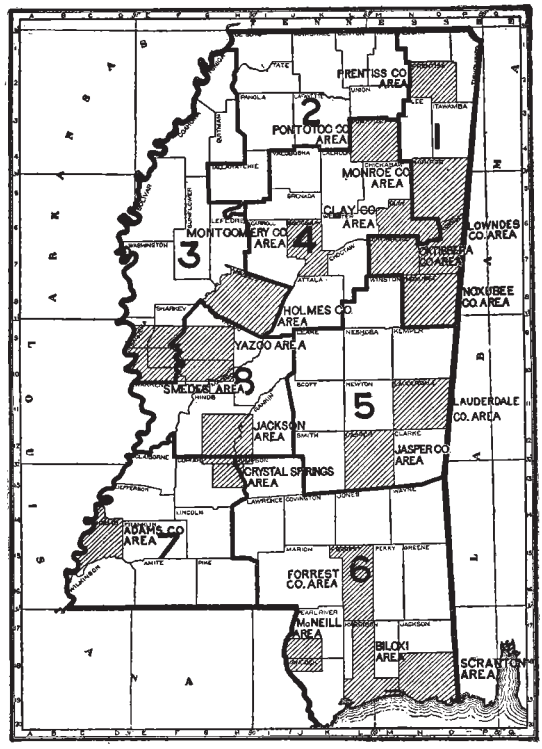

FIG. 23.—Sketch map showing areas surveyed in Mississippi.

A triangular area just above the southeast corner of the county, embracing perhaps 50 square miles, is drained by Beaver Dam Creek, an east-flowing stream. The remainder of the two southern townships incline to the south and are tributary to Red River, which crosses the extreme southwest corner of the county.

All these streams and scores of the smaller ones are perennial. Many of the short branches flow most of the year, or at least afford water at various points, for springs are numerous in all the hilly lands. On the lower terraces of the Leaf River at Hattiesburg there are a number of strong artesian wells, their depth being about 400 feet. On the high terraces and also on the most of the uplands excellent water is found at depths ranging from 25 to 50 feet. The wells on the high divide near McLaurin are from 60 to 100 feet in depth.

Below Hattiesburg the Leaf River is considered navigable. The Bouie, which is about half as large as the Leaf, is a remarkably deep, swift stream flowing for the most of its way through this county in a channel 20 to 30 feet below the average level of the first bottoms.

The valleys of the latter streams are marked physiographic features of the northern part of the county. Including the high terraces, like that on which Hattiesburg is built, the average width of the Leaf Valley is nearly 4 miles and that of the Bouie about 2 miles.

The uplands east of Leaf River rise to a height of perhaps 150 feet above the general level of the lowlands. The surface is rolling to moderately hilly, with some steep slopes along portions of the river and some of the minor drainage ways. The middle of this section includes several square miles of comparatively level land, a remnant of an old plain. From Lotts Creek northward the margin of the uplands is formed more or less by bluffs. The same is true of the opposite side of the valley from McCallum to the eastern boundary of the county.

Between the Leaf and Bouie Rivers the surface rises in a series of benches extending north for several miles and culminating in the Eatonville Level. Both the east and west sides of this plateau are quite hilly.

The uplands in the northwest township rise rather gradually from the Bouie Valley. The contours are generally mild, particularly in the areas of Susquehanna soils. West of Hattiesburg similar topography prevails, but from the head of Burketts Creek to McCallum most of the land drained by the numerous short tributaries of Leaf River is decidedly hilly.

South of the heads of the latter branches a high divide crosses the county, the watersheds between the Leaf River and Black Creek systems of drainage. The southern inclination of this great divide has generally rather mild topography. While the local relief is strong and some of the ridges between the heads of the minor streams are somewhat broken, much of the surface is rolling to moderately hilly. At McLaurin the elevation is 350 feet above sea level.

The valley of Black Creek is from 1 to 2 miles in width, including the high terrace near Brooklyn. Immediately south of this valley

the uplands are hilly, becoming quite broken along Little Black and Big Creeks.

Most of the topography south of the Black Creek drainage basin is undulating to moderately rolling. From the Columbia division of the Gulf & Ship Island Railroad west of Helena the surface declines in long easy slopes to Double Branch. Between the numerous short branches that cross the south county line the relief is stronger, high, rolling ridges being the characteristic surface form of this section. In the triangular area tributary to Beaver Dam Creek the topography is varied, being usually most broken between the north-flowing streams.

In the northern and middle townships there are a few tracts of virgin pine, but most of the original forest has been removed. Throughout most of the county the characteristic upland landscape is a wide area of blackened stumps, with an irregular and scattering stand of pine poles, saplings, and dead trees. The ground is generally more or less encumbered with half-burned tops and rejected logs that have escaped the annual fires which consume the lighter trash and undergrowth. Where the Norfolk types predominate there is usually so little standing timber that the view for miles is but slightly obstructed and every detail of the topography is easily visible. On the hilly lands there is more timber remaining, especially oak, with which there is mixed an increasing proportion of dogwood, hickory, and poplar in the ravines. The occurrence of sand areas is usually indicated by an abundance of scrubby oak, while the stream courses are marked by narrow strips of dense woods.

The high terraces were formerly covered with pine, but most of it has disappeared and much of this land is being cultivated. On lower benches, where the Kalmia soils are found, there is still a good deal of longleaf and shortleaf pine with considerable hardwood. South of Black Creek there are several large tracts of pine, but the remainder of the southern townships has been deforested.

Hattiesburg, the county seat, has a population of 11,733. The town is an important business center of southeastern Mississippi. It contains a number of wholesale houses, machine shops, factories, and several large sawmills. The State normal school is also located near the city.

The New Orleans & Northeastern Railroad has a direct line to New Orleans and to points north of Hattiesburg in eastern Mississippi and western Alabama. The Gulf & Ship Island Railroad crosses the area from north to south, its termini being Jackson and Gulfport. The Mississippi Central extends from Hattiesburg to Natchez. This railroad is being extended in a southeasterly direction from Hattiesburg, but is now used chiefly as a logging road. A

branch of the New Orleans, Mobile & Chicago affords direct connection with Mobile.

The main country roads across the uplands are generally located on the divides; those in the valleys follow as far as practicable the outer margins of the terraces. In each case but little labor is required to keep them in fair condition.

Improvements on all farms are much better than a decade ago. Frame buildings and wire fences are rapidly replacing the log and rail structures formerly so common. While there are many old homesteads in the valleys, and a few well-known settlements like that of Eatonville, the county as a whole is very thinly settled and practically in the earlier stages of its agricultural development. Except near the towns there are but few old farms on the uplands. Conditions in this respect are changing, and new houses and recently cleared fields may be observed in all the larger areas of desirable land.

CLIMATE.

The climate of the area is that of the warm temperate zone, perceptibly modified by the Gulf of Mexico. This is especially noticeable in midsummer, when the south winds are often agreeably cool and pleasant.

The long period of summer weather, beginning, as a rule, about the 1st of May and lasting until September, is somewhat enervating, but not unhealthful. Farm work may be carried on without inconvenience during these months, and with but little interruption by prolonged rains or storms in the winter season.

There is not a very wide range between the mean temperature of the summer and of the winter months, the former being about 82° and the latter 51°. The absolute minimum temperature given in the accompanying table is very exceptional. While the thermometer sometimes drops to 10 or 15° below freezing, such cold periods are of short duration. The ground never freezes more than a few inches deep. Fall-sown oats and rye and Bermuda grass grow more or less all winter.

The average date of the last killing frost in the spring is about March 30 and the first frost in the fall may be expected about November 1.

The native grasses usually afford pasturage early in February. Wild violets and yellow jasamine also appear about this date, while the dogwood, azalea, and spirea are in full flower a week or two later. Pears, plums, and peaches are generally in bloom from the first to the middle of February.

The precipitation is usually well distributed, although there are few years in which there is not an excess or a deficiency in the rain-

fall for a period of a few weeks in the summer. These departures from the normal, however, are not often of such magnitude as to affect crops seriously on well-prepared and properly tilled soils.

The accompanying table, compiled from the records of the Weather Bureau station at Hattiesburg, gives more detailed information concerning the monthly temperatures and precipitation:

Normal monthly, seasonal, and annual temperature and precipitation at Hattiesburg, Miss.

Month.	Temperature.			Precipitation.			
	Mean.	Absolute maximum.	Absolute minimum.	Mean.	Total amount for the driest year.	Total amount for the wettest year.	Snow, average depth.
	°F.	°F.	°F.	*Inches.*	*Inches.*	*Inches.*	*Inches.*
December	51	85	13	4.4	6.5	5.2	Trace.
January	49	82	16	4.6	3.9	6.2	Trace.
February	52	85	− 1	5.3	2.8	4.2	0.9
Winter	51	.....	.....	14.3	13.2	15.6	0.9
March	61	88	24	4.3	2.0	7.0	0.0
April	66	93	33	3.3	0.5	2.9	0.0
May	75	98	39	2.6	0.4	4.0	0.0
Spring	67	.....	.....	10.2	2.9	13.9	0.0
June	81	103	52	5.3	5.3	1.3	0.0
July	82	103	60	6.1	3.0	5.3	0.0
August	82	103	55	5.3	1.8	7.2	0.0
Summer	82	.....	.....	16.7	10.1	13.8	0.0
September	77	101	40	2.5	0.8	7.2	0.0
October	67	95	30	1.5	0.5	4.2	0.0
November	57	87	21	2.9	1.9	3.0	0.0
Fall	67	.....	.....	6.9	3.2	14.4	0.0
Year	67	103	− 1	48.1	29.4	57.7	0.9

AGRICULTURE.

Probably the first lands in the county cultivated by white people were some small fields in the Leaf River bottoms. The earliest settlers built their cabins on the lower terraces, but usually cleared a few acres of the rich soil on the first level, where corn, potatoes, and a few vegetables were planted after the spring floods subsided. In later years the clearings were more generally made on the well-drained portions of the second bottoms and most of the low fields were abandoned.

The first farms of any considerable size were clearings on the Eatonville Level, begun very early in the last century. Most of

the farms here, as well as those in the scattered settlements throughout this and adjoining counties, came from the Carolinas and Georgia. A few families owned slaves, and later on, as their holdings increased, their homes assumed the dignity of plantations. This was somewhat exceptional, however, for the average homestead long continued to be a cabin with only a few acres of cleared land adjoining. Little attempt was made to grow more than enough corn, potatoes, and a few other products required by the family. Most of the settlers soon acquired herds of cattle and hogs. This stock needed no care, for the open, grassy pine woods and numerous canebrakes afforded fine grazing the entire year.

Mobile was the chief trading point for this entire region. For many years the annual drives of live stock to that town and the return trip with the limited amount of "store goods" needed were features of pioneer life. Such conditions practically prevailed until after the Civil War. In general, there was but little industrial development; and while they had free use of the great tracts of Government land, there was no incentive for any change in the agricultural habits of the people.

In the late seventies the value of the great pine forests began to attract attention, and in the next few years thousands of acres of the public land passed into private ownership. Some was acquired by residents of the county, either by purchase at $1.25 an acre or by homesteading, but the greater proportion was bought by northern capitalists. This was the beginning of the vast timber holdings in this and adjoining counties whereby a few companies now own immense tracts of land.

The marked industrial activity of the last twenty years has been based almost entirely upon the lumber business. While there was a great increase in population and a rapid rise in all land values, farming received comparatively little attention. It is now generally recognized that the chief economic problem is the agricultural development of the great areas of cut-over pine lands.

The assessors' returns for 1910 show about 15,000 acres of cultivated land in the county, exclusive of lots in the incorporated towns. The valuation of all lands outside the towns is given as $1,350,757, representing about one-third its actual value.

In most instances the value of the standing pine is the first consideration and the agricultural worth of the land is a secondary matter. Much of the cut-over land is now held at prices ranging from $5 to $10 an acre. Desirable tracts located near the towns are held at a much higher figure.

On most of the farms the agricultural methods are quite similar to those generally practiced on the lighter soil types of the Gulf Coast region. Cotton, corn, sweet potatoes, and sugar cane are the chief

crops, ranking in about the order named. One-horse implements are in general use, and the "bedding-up" method of preparing the ground for planting is most commonly practiced. In recent years a much greater number of improved implements have been introduced and better methods of tillage more commonly followed. This is due to the increased cost of labor, the threatened invasion of the boll weevil, which for the first time appeared in 1910, the better demand for farm products, and also to the State-wide campaign for more diversified farming. The acreage of corn and oats is increasing, and the growing of peanuts on a commercial scale has been taken up recently. Near Hattiesburg considerable truck is raised, the local demand for sirup, sweet potatoes, watermelons, and most of the more common kinds of vegetables being pretty well supplied. Transportation facilities and a diversity of soils favor the extensive production of the truck and fruit crops usually grown in this section of the South.

The lighter types of the Cahaba soils are well adapted to most early truck crops. The Kalmia types, where well drained, are more suitable for crops requiring a longer growing season and a steady moisture supply. Most of the Orangeburg sandy loam and the heavier types of the Ruston series afford good locations for peach orchards. In this connection it is suggested that trees on north hillsides stand a slightly better chance of escaping late frost than those on southern slopes.

In the vicinity of Hattiesburg strawberries ripen early in March; Irish potatoes [1] are ready for use about May 10, and sweet potatoes [2] about July 1, although the main crop is much later. Tomatoes ripen about the last week in May, and watermelons from June 20 to July 1. All these crops have a long season, depending of course upon the date of planting and weather conditions.

Stock raising [3] should prove profitable. While most of the local demand for beef is met by cattle from the range, much of the dairy products and most of the pork and poultry consumed comes from outside of this section of the State. The same is true of corn, oats, and hay, the greater proportion of such feedstuffs now used in the towns being obtained from northern and western sources.

Although grain can not be grown profitably for sale, except perhaps on the Ocklocknee soils, if the latter are brought under cultivation, none need be purchased by farmers, even if the number of live stock kept on each farm is increased many times. Oats [4] sown in October seldom fail of making a good crop. They are generally

[1] Farmers' Bul. No. 407, The Potato as a Truck Crop.
[2] Farmers' Bul. No. 324, Sweet Potatoes.
[3] Farmers' Bul. No. 411 and Alabama Agr. Exp. Sta. Buls. Nos. 150, 151, and 154.
[4] Farmers' Bul. No. 436, Winter Oats for the South.

used as hay, but in recent years a few farmers have thrashed this grain. The yields have ranged from 15 to 30 bushels per acre.

The yield of corn[1] varies from a few bushels per acre to as much as 40 or 50 on especially well tilled ground. In many instances this crop does not receive the best of cultivation, and the fertilizer requirements are poorly met by the customary application of a few hundred pounds of cotton seed and a little acid phosphate to soils markedly deficient in humus. Since corn makes such large demands upon the soil for nitrogen, the humus supply should be liberally increased. It is hardly practicable to do this except by a rotation of crops that affords an opportunity to turn under considerable quantities of green manure once in two or three years. On the Cahaba silt loam there should be no need for other fertilizers than nitrogen, but on practically all the upland and terrace soils phosphorus seems necessary. Nitrate of soda can not be strongly recommended, chiefly because its continued use invariably tends to neglect of maintenance of the humus supply. The high price of cottonseed meal in recent years in many instances has caused a too meager use of this valuable fertilizer.

In all instances a good physical condition of the soil is the first consideration and its importance can not be too strongly insisted upon. On the heavier types this may be secured by deeper plowing, flat breaking instead of ridging up the land, and frequent shallow cultivation. Larger horses and better implements could be used to advantage on all such lands.

Owing to the threatened invasion of the boll weevil, such measures as have been found beneficial in infested areas should be adopted. Early, well-drained soils are to be preferred to the heavier types. In this respect the sandy and fine sandy loams of the Orangeburg, Norfolk, and Cahaba series are safer, other conditions being equal, than the Susquehanna silt loam or most of the Kalmia soils. On the latter types, as well as on the level phase of the Norfolk loam, an excess of rainfall during any portion of the growing season tends to delay maturity, a condition always to be avoided in weevil-infested territory. For the same reason the Cahaba silt loam will be found somewhat inferior to the less fertile but warmer sandy soils of the terraces. Early varieties only should be planted and seed of doubtful origin or known to be from large, late-growing kinds of cotton should be rejected. Such cultural methods as hasten the growth of the plant and wider spacing of the rows is recommended, so that the ground may not be shaded densely.[2]

Most of the fertilizers now used for corn and cotton are mixtures of cottonseed meal and acidulated rock phosphate. The relative pro-

[1] Farmers' Buls. Nos. 281 and 414.

[2] See Farmers' Bul. No. 344, "The Boll Weevil Problem;" also, Bul. 51, Bureau of Entomology, "Mexican Cotton Boll Weevil."

portions of each, as well as the quantities applied, are extremely variable. From 200 to 400 pounds per acre is quite commonly used on cotton and corn land.

In a soil well stocked with humus there is little need of additional nitrogenous fertilizer, and the presence of the organic matter renders available more of the phosphorus and potash already in the soil or which may be added as a mineral fertilizer.

The Greenville, Orangeburg, and Norfolk types differ in so many respects that no specific directions concerning fertilizer requirements can be given other than the general one just outlined. After securing an increase in the organic-matter content in which all are very deficent, experiments with mineral fertilizers would give valuable suggestions as to local requirements for the staple crops.

On the Norfolk loam lime can be safely recommended, but this mineral should always be used in conjunction with liberal quantities of vegetable matter.

Cowpeas,[1] velvet beans,[2] soy beans,[3] and vetch can be easily grown on all well-drained types. These afford the cheapest means of soil enrichment with regard to nitrogen needs. A winter cover crop like oats or rye is also invaluable in preventing leaching by the winter rains.

As a greater acreage of land is cleared and machinery can be used to better advantage, the hay crop should become of great importance. Johnson grass and redtop do well on lands too wet to be safe for other crops. Bermuda,[4] lespedeza,[5] and carpet grass are becoming established on all uncultivated land on which the native vegetation is being destroyed. A luxuriant growth of crab grass and "Florida pursley" usually take possession of all unshaded ground after early crops are laid by.

Where the land is farmed by tenants the customary rental is one-half the crop, the landlord furnishing teams, tools, and one-half the fertilizers used. In some instances other terms are agreed upon, especially if new land is being brought under the plow.

Farm labor has been rather difficult to secure on acount of the opportunities for employment in sawmills and other lines of business.

The great lumber companies are generally encouraging the settlement of the cut-over lands. The price of the latter in small tracts ranges from $5 per acre upward. In many places the selection of a 40 or 80 acre tract will be granted, and the price determined according to location and character of the land, usually between $5 and $10 an acre.

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[1] Farmers' Bul. No. 318.
[2] Bul. No. 102, Florida Expt. Sta.
[3] Farmers' Bul. No. 372.
[4] Circular 31, Div. of Agrostology, Bur. Plant Industry, and Bul. No. 90, Oklahoma Expt. Sta.
[5] Farmers' Bul. No. 441.

On the most desirable lands there is usually but little standing timber of commercial value. The smaller trees with the logs and tops remaining unburnt by the annual fires are generally sufficient to afford rough building material and an abundance of fuel. The cost of clearing stump land so that machinery may be used will range from $10 to $20 an acre. It is possible, however, to cultivate land quite satisfactorily where only the fallen timber and small stumps have been removed.

SOILS.

The soils of the county fall naturally into two divisions—the upland types and those of the valleys, the latter including the high terraces along the larger streams. In each group the differentiation of the soil-forming materials into types and phases is due more to processes of weathering than to inherent differences in the nature of the original deposits. The clay and sand beds that form the uplands do not present a very wide range in their general mineralogical composition, but erosion, solution, and oxidation have everywhere affected their superficial portions and produced physical and chemical changes of greatest importance from the standpoint of soils.

The alluvial deposits have not generally been affected by atmospheric agencies to such a degree as the upland materials. In all except the most recent sediments weathering, as influenced by local drainage conditions, has modified the original character of the materials and largely determined their present agricultural values.

Over a large proportion of the uplands the surface formation is a fine-textured, yellowish loam. It consists chiefly of silt, clay, and fine sand occurring in proportions about in the order named, except in the immediate surface layer, or top soil, where fine sand usually predominates. This deposit is deepest over the central portions of the main divides, averaging on the undulating areas 10 to 15 feet in thickness. In the hilly lands the general depth is less, while on many of the steeper slopes the silty deposit is entirely wanting, or so thin as scarcely to mask the character of the underlying material. It is also absent from some sections of the uplands where erosion could not have been the cause of its removal. This silt deposit undoubtedly forms the surface of the highest terraces, but its presence on the lower ones can not be affirmed.

This silty material was deposited in some manner after the present topographic features had been impressed upon the region. Possibly it represents the eastern extension of the loess, or bluff formation, of the western part of the State.

Wherever this superficial stratum has a thickness of more than 3 or 4 feet it has given rise to the Norfolk loam, a type of high agricultural value. Where the depth is generally less than 2 or 3 feet

departures from the Norfolk type are found. In such cases the character of the soil is largely determined by the nature of the underlying material. In many instances an addition of more than the usual percentage of sand has occurred, or the substratum may be very sandy. In either case the comparatively free circulation of ground water and the more ready admission of air has resulted in a high degree of oxidation, so that red and brown tints prevail. This change in color and the difference in texture warrants the assignment of such types to either the Ruston or the Orangeburg series.

The silty formation is quite generally underlain by a heavy bed of sedimentary clay. The latter has innumerable exposures in all the hilly sections, and quite frequently shows at the surface on comparatively level land. Several square miles of the northwestern township consists largely of this clay with such a thin or patchy occurrence of silt over it that the dominant soil type—the Susquehanna silt loam—is derived almost entirely from the clay. Similar conditions are found in many places throughout the western and southern portions of the county, but the individual areas of the Susquehanna soil are usually small.

The unweathered clay from which the above type is derived is a light-gray material containing an appreciable proportion of very fine sand. Feldspathic minerals are present in considerable quantity, also representatives of several others. It is relatively free from iron, so that the red tints characteristic of the thoroughly weathered upper portion—where the latter is a surface exposure—are derived from the associated deposits, for most of the latter contain rather high percentages of iron.

A number of the upland types are red or reddish-brown sandy loams derived from relatively deep sands. The latter overlie the clay beds in many places, forming the present surface material, or at least a large proportion of it. In such instances the silty formation to which the Norfolk loam owes its origin seems to be absent, or has lost its identity by becoming incorporated with the sand. The appearance of the upper part of the sandy deposits supports the latter view. While the immediate surface is usually a loose sand or very light sandy loam, there is in most instances a layer of heavier material between the depths of 10 and 30 inches. Within this zone there seems to be a localization of the finest soil particles forming a more or less compact sand-clay stratum. Below it loose reddish sand is found to depths evidently ranging from 25 to 50 feet, judging from the accounts of well diggers.

Such a condition in the superficial portion of comparatively coarse sand beds would result if upon the latter limited amounts of fine material were subsequently deposited. It would tend to accumulate in the middle and lower parts of the soil section, while the surface

layer would eventually consist largely of the coarsest and most resistant particles of the older material.

This conception of the origin of the Ruston soils of this area is strongly suggested by the structure of most of them. With a few exceptions, all are essentially rather deep sands, with such a varying amount of interstitial material in the first few feet as to throw the heaviest types in the sandy loam class. The Ruston fine sandy loam does not conform to this description, being transitional between the Norfolk loam and the Orangeburg soils.

The latter are the surface expressions of sand-clay materials in which the clay forms a larger proportion of the mass than in the Ruston soils. The Greenville loam, a type closely related to the Orangeburg, contains even more argillaceous material and a higher percentage of iron than the latter.

The physical structure of these two types is exceptionally favorable to the maintenance of excellent moisture conditions, as measured by the requirements of cultivated crops. In the Greenville soils particularly capillarity and aeration are effective to profound depths, compared with the same processes in the lighter colored types This is doubtless the chief cause of the high degree of oxidation of its ferruginous minerals.

None of the previously mentioned types are well developed where very hilly topography prevails. In all such areas the soils are a more or less variable mixture of materials derived through surface wash and creep from the adjacent higher lands and from outcropping strata. This heterogeneous material generally gives rise to reddish sandy loams, necessarily lacking in uniformity with regard to depth, structure, and cultural value. The rolling phase of the Ruston sandy loam and the gravelly sandy loam of this series are examples of such types.

The last-named soil is characterized by an abundance of gravel, which is also present to some extent on all the hilly lands. This stony material consists for the most part of well-rounded quartz and chert pebbles ranging in size from small shot to pieces 2 or 3 inches in diameter. This gravel occurs sparingly in the Norfolk, Orangeburg, and several associated types, but does not seem to be an appreciable component of the deposits from which they are derived. It most commonly occurs on the crests of high narrow ridges where surface erosion has been especially vigorous in removing the finer materials. Extensive beds of this gravel are found in the river valleys, underlying nearly all the bench lands except possibly the higher ones.

While this gravel and the red sands associated with it may be of Lafayette age, the deeper beds of sand are so intimately related to

the underlying clay as to suggest a relatively recent sedimentary origin.

In the Leaf and Bouie Valleys red soils—the Cahaba types—are generally found on the margins of all the terraces as a result of the better aeration and drainage such locations afford. A little farther back, where the relief is slight, the moisture movement within the soil mass sluggish, and the aeration correspondingly ineffective, soils with light-yellowish subsoils have been developed. Such types have been correlated with the Kalmia series, and have an extensive distribution in all the larger valleys irrespective of local elevation or source of the parent materials. Extremely poor underdrainage is usually indicated by light-gray, white, or mottled subsoils. In all instances the coloration of the subsoil is a fairly reliable index of the average moisture conditions.

As a rule the deposits of Leaf and Bouie Rivers and of Tallahala Creek give rise to more durably fertile soils than the alluvium of the other streams rising within or crossing this area. This is doubtless due to the fact that the headwaters of the Leaf cross the outcrops of the Vicksburg limestone some 40 miles north of this county, while the upper branches of the other two streams reach well back toward the lime exposures and receive contributions from the associated formations. Materials from such sources are richer in the mineral elements of fertility than the highly siliceous sands and clays of the Grand Gulf formation, which is the ultimate source of most of the alluvium of all the minor streams.

In general, the physical features of the soil types are of greater importance in determining their present and future agricultural values than distinctions of a chemical or mineralogical nature. While the latter have been given consideration in the classification and the more prominent characteristics of this kind indicated in the type descriptions, the topography, texture, and structure—permanent factors in land values—have received more detailed attention.

On the scale of map used it is impossible to show all the small areas of different soils and equally impracticable to indicate the innumerable minor phases and transitional zones between the larger developments of distinct types.

The following table gives the names and extent of the various soil types of the county:

Areas of different soils.

Soil.	Acres.	Per cent.	Soil.	Acres.	Per cent.
Norfolk loam	9,408	27.0	Cahaba loamy sand	5,312	1.8
Rolling phase	69,952		Ruston gravelly sandy loam	3,648	1.2
Ruston sandy loam	11,072	21.9	Bibb silt loam	2,176	.7
Rolling phase	53,440		Cahaba silt loam	1,920	.7
Kalmia loam	31,744	14.4	Cahaba sand	1,792	.6
High terrace phase	10,688		Ruston sand	1,792	.6
Susquehanna silt loam	14,336	6.6	Cahaba fine sand	1,728	.6
Rolling phase	4,928		Greenville loam	1,600	.5
Meadow	12,416	4.2	Leaf fine sandy loam	1,472	.5
Cahaba fine sandy loam	8,512	4.0	Myatt silt loam	1,216	.4
High terrace phase	3,328		Norfolk sand	1,024	.3
Ocklocknee clay	10,176	3.5	Riverwash	896	.3
Ruston fine sandy loam	9,856	3.4	Kalmia fine sand	832	.3
Ruston loamy sand	7,168	2.4	Total	294,400	.....
Orangeburg sandy loam	3,584	2.1			
Rolling phase	2,560				
Cahaba sandy loam	3,840	2.0			
High terrace phase	1,984				

GREENVILLE LOAM.

The Greenville loam is characterized by the deep reddish hue of the materials composing it. Even the coarsest particles seldom assume the grayish or bleached appearance commonly presented by sand grains on exposure to atmospheric weathering. The prevailing color of the surface soil is a very dark reddish brown when wet, and a much lighter shade of brown if dry. Below this dark superficial layer the material to a depth of about 10 feet is bright red. The color in many instances is as intense as that of a good quality of ocher, staining the fingers red when a moist sample is handled.

In most places the soil to a depth of 4 or 5 inches is a loam, grading laterally in the lightest phases to a moderately heavy sandy loam of somewhat greater depth. The content of clay is high, especially in the lower part of the soil.

The contact between the soil and subsoil is well defined. The latter contains much more clay than the former. At the usual moisture content it is a firm, hard material that offers much resistance to penetration by any implement. It is not impervious, however, for the abundance of rather coarse, angular quartz grains embedded in the matrix of clay and finely divided iron oxide greatly increases the porosity of the mass, imparting the harsh, grainy feel observed when a piece of it is handled. The material is generally uniform in color and structure to a depth of 8 or 10 feet. At greater depths it is a red sand, changing below to lighter-colored clayey strata.

The surface, of this type is very gently undulating. It consists of broad, shallow depressions locally termed "basins," alternating irregularly with low swells, or ridges, the maximum relief being but a few feet. The soil in the "basins" is heavier and darker colored than that on the slight elevations. The latter, in most instances, is a rather coarse sandy loam.

The structure of the subsoil and the material just below not only admits of a comparatively rapid absorption of a heavy rainfall, but the porosity is such that excellent capillarity is induced. Thus the soil moisture moves readily whenever the balance is disturbed by evaporation at the surface, or the requirements of growing plants. If the soil becomes compacted, or is very cloddy, the upper part of the soil section may become very hard, or be so dry that the crop suffers. If the soil is kept in good tilth there will be no trouble of this kind. Like all heavy types, it requires more careful management, and also heavier implements, than are necessary on sandy loams.

The high degree of fertility of the Greenville loam is due in a large measure to the physical properties just mentioned. The great depth to which aeration has taken place is also a factor of importance.

This type responds readily to commercial fertilizers, and is especially susceptible to applications of barnyard manure. A light dressing of the latter produces highly beneficial and lasting results.

The average yields of corn may be placed at about 25 bushels per acre, and of cotton at one bale. Much of this land has been in cultivation many years, and the soil in some fields is in poor physical condition.

This is a highly desirable type for general farming. It is too late for truck crops, and not especially suitable for sugar cane on account of the dark color of the sirup. The iron content is too high to admit of the successful production of alfalfa.

The largest area of this type is found on the Eatonville Level. Farms in that locality consisting chiefly of this soil are valued at about $50 an acre. The few small areas located in the northeastern part of the county and one near Brooklyn are not so distinctly different from the adjoining Orangeburg types as other areas, but are recognized as very valuable land for general farming.

ORANGEBURG SANDY LOAM.

The soil of the Orangeburg sandy loam is a grayish-brown or dark-brown to dull reddish brown loamy sand to sandy loam. All grades of sand are well represented, including enough of the largest particles to give the immediate surface a coarse, gritty feel. At a depth

of a few inches the proportion of silt and clay, particularly of the latter, is relatively high, so that this part of the soil, in uncultivated ground, is a moderately compact loam. In well-plowed fields the soil is generally crumbly; in the lighter phases quite friable, yielding easily to tillage if moderately moist, but decidedly inclined to pack when wet.

No very close distinction can be made between soil and subsoil. Six or 8 inches below the surface the latter is a loam or clay loam that with slight increase of depth becomes a bright red sandy clay. The lower subsoil is a firm, compact material that would doubtless be somewhat impervious were it not that the included sand increases considerably the porosity of the mass. It is this angular sand, much of which is of medium grade, that gives the "grainy" structure characteristic of the Orangeburg soils.

The red sandy clay extends, without essential change in character, to a depth of 8 or 10 feet. It is said to be underlain by reddish sand, becoming coarser and lighter colored at greater depths.

This description of the Orangburg sandy loam is applicable chiefly to the small areas on the uplands east of Leaf River and to the minor developments of the type in the northeastern part of the county. Practically all are nearly level tracts of excellent farm land. In the southern part of the county the type occurs on the tops of some of the wider divides. The lighter colored phases are usually lighter in texture also, and no close distinction can be drawn between these soils and the Ruston types.

Near Helena there are several local depressions in the uplands where a lighter phase of the Orangeburg has been developed. The soil to a depth of 15 or 20 inches is a reddish-brown loamy sand. The subsoil is a red sandy material ranging in structure from a light loam to a moderately heavy sandy clay. The moisture-holding properties are excellent, and to this may be safely attributed the high agricultural value of the phase. These small areas are indicated upon the map by symbols.

Most of the Orangeburg sandy loam is now devoted to corn and cotton. The average yield of the latter is more than 1 bale per acre; of the former, from 20 to 30 bushels. These returns are usually secured without other fertilization than a mixture of cottonseed meal and phosphoric acid, applications ranging from 200 to 400 pounds per acre for cotton, and generally less for corn. Like most of the soils that have been in cultivation many years, the content of humus is so low that there must be in most instances a deficiency in available nitrates. This type should be so managed with regard to succession of crops that a considerable amount of vegetable matter could be turned under once every three or four years. Barnyard manure has the same effect, but is seldom available in sufficient

quantities. While this soil responds readily to any fertilization, most of the old fields are in especial need of an increase in the supply of humus.

All of this type has excellent natural drainage, and the structure of the subsoil and underlying material insures good capillarity and aeration. It is better adapted to cotton, grain, and forage crops than to truck. The lighter phases may be utilized for the latter purpose with good results.

Most of the type is included in farms, the value of which ranges from $25 to $50 an acre. Limited areas in the southern part of the county are still unimproved. Such land has a value of about $10 an acre.

Orangeburg sandy loam, rolling phase.—On the hillsides below the comparatively level areas of typical Orangeburg sandy loam the soil in many instances is very similar to that of the higher ground. It is a grayish to reddish loamy sand or sandy loam of variable depth, overlying the characteristic red sandy clay of the Orangeburg types. In general all of the material is coarser than that of the level land, and in places there is some gravel.

The surface inclination ranges from gentle slopes to hillsides too steep to be farmed. Such areas as may be tillable are usually of irregular shape and limited extent. While they have less desirable surface features, the physical characteristics are about the same as those of the typical soil.

Nearly all of the rolling phase is yet virgin soil. The remaining timber is a mixed growth of pine and oak with some hickory and other hardwoods. There is usually but little underbrush except in the ravines.

Mechanical analyses of the typical soil and subsoil gave the following results:

Mechanical analyses of Orangeburg 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.*
421917	Soil	0.9	7.1	11.4	20.0	5.6	47.4	7.2
421918	Subsoil	.8	6.5	9.5	15.8	6.0	36.8	23.8

NORFOLK LOAM.

The Norfolk loam to a depth of about 6 inches is a gray to grayish-brown soil in which there is a high percentage of fine sand and silt. The proportion of medium sand is low, and there is practically no coarse material of any kind. In the first few inches of virgin soil there is enough humus to impart a rather mellow structure, and give

a much darker tint than prevails in the lower part of the soil. The latter is light gray, tending to yellowish gray with increase of depth. In cultivated fields the surface assumes a somewhat ashy gray color, and small friable clods are usually abundant.

The subsoil is a yellow or brownish-yellow heavy loam; compared with the soil there is a noticeable increase in the percentage of clay, so that when moist—as is usually the case—the material molds easily in a hand sample and is but slightly sticky, being crumbly rather than plastic. In most instances there is enough fine sand to give a rather high degree of porosity and prevent that closeness of structure which characterizes the subsoil of the Susquehanna types. This material is permeable throughout, although it absorbs water slowly and parts with it reluctantly.

As a rule there is but slight change in color or structure at less than 30 inches from the surface. At lower depths the underdrainage and aeration may be less efficient, in which case bridge reddish brown iron stains occur, with occasional flakes and streaks of whitish clay.

In some of the flat or slightly depressed places the subsoil is lighter colored and less permeable than in the more undulating areas. The substratum of the latter at a depth of 6 or 8 feet, and in many instances to greater depths, is very similar to the subsoil proper, admitting of effective underdrainage and aeration. The heavy bedded clay, from which much of the material forming this type is undoubtedly derived, usually lies too far below the surface to exert any undesirable influence upon the moisture content of the subsoil proper.

The largest area of the Norfolk loam is found upon the level uplands about 6 miles northeast of Hattiesburg. A few smaller tracts occur on the high lands south of the headwaters of Lotts Creek. In general the surface, while including an occasional flat spot, is very gently undulating. Most of these areas merge into the rolling phase on their outer borders, or in some instances the northern limits are marked by rather abrupt transitions to the Ruston sandy loam surrounding the heads of the local drainage lines.

In the larger developments of the rolling phase there are numerous areas of from 10 to 100 acres where the surface conditions are very similar to those of the typical phase. Limited portions of the level tracts resemble the Myatt silt loam, the soil being lighter colored and more silty and the subsoil heavier than in the normal phases of the Norfolk types. In such locations water stands for days after each heavy rain. There are no permanent ponds, however, except a few very small ones filled with black gum trees.

While but little of this type absolutely requires artificial drainage, practically all would be benefited by open ditches or tiles. The subsoil and underlying stratum are so retentive of moisture that excess surface water should be drained away as promptly as possible. This

would increase the average depth to which aeration is effective, an improvement especially desirable wherever gray and yellowish mottling may be found in the lower subsoil.

The Norfolk loam is well adapted to general farming. Cotton makes excellent yields, upward of one bale per acre where good tillage is given. In most instances the fertilizer consists of mixtures of cottonseed meal and acid phosphate, and but little stable manure or humus-forming material of any kind is used. If the deficiency in the latter element were supplied, good yields of corn should be secured, for the physical structure of the type resembles that of a good corn soil. The present yields of corn in both this and the rolling phase range from 15 or 20 bushels per acre to as high as 30 bushels.

Practically all the forage crops of this section should be successfully grown on this land. It is not so well adapted to truck, although sugar cane, watermelons, and sweet potatoes do well on the lightest and best-drained phases of this soil.

There is little danger of any crop suffering on this land in either wet or dry seasons if proper tillage is given. The ground should be plowed rather deep, for in such a soil there is liability of a hardpan forming at about the contact of the soil and subsoil if shallow plowing is practiced continuously. Cultivation should be generally shallow, however, and care taken to work the ground only when the surface is reasonably dry. This soil can not be cultivated safely under as wide a range of moisture conditions as the more sandy types. If the humus content were increased by turning under liberal amounts of green manure, the tendency to "run together" noted with the deeply plowed land of this kind in wet weather would be lessened.

Where the methods of soil improvement suggested above are practiced on the Norfolk loam and its rolling phase it will be found advantageous to use chiefly acid phosphate as a fertilizer for corn and cotton. The nitrogen requirements will be quite well supplied by the green manuring, with such amounts of stable manure as may be available. The need for potash does not seem to be so marked. Lime could be safely used under such conditions, and on flat areas is needed to correct acidity.

Very little of this type is now cultivated. Most of it is recently cut-over land on which there was little timber except longleaf pine. The adaptability of the types to grasses is indicated by the excellent pasturage which most of it affords.

Norfolk loam, rolling phase.—The soil and subsoil of the rolling phase of the Norfolk loam bear a close resemblance to those of the typical soil. Owing to the somewhat more effective drainage the undulating land enjoys, the soil is a little more sandy, in many instances, than that of the level ground. There are also more frequent variations in the depth to which change becomes apparent in

the texture or color of the soil when compared with the subsoil. The latter also exhibits frequent departures from the type color, owing to inherent differences in the physical or mineralogical nature of the parent material, or in some cases to exceptional topographic position.

In most places the subsoil is a yellow or light yellowish brown clay loam. While very retentive of moisture, it is permeable and admits of good underdrainage. With few exceptions the physical structure is highly favorable to the maintenance of satisfactory moisture conditions.

In many of the larger areas of this phase, as well as in all of the smaller ones associated with the Ruston types, the underlying stratum is usually a fine sandy or silty clay. It is in most instances a little more permeable than the subsoil proper. Brown and red tints prevail, frequently grading at a depth of a few yards below the surface to a pronounced red. On many of the steeper slopes, and occasionally on the crests of the ridges, the lower subsoil is light reddish brown, owing to the somewhat coarser texture of the material.

The heaviest phases of this soil are usually found in those areas adjoining the Susquehanna silt loam. In such localities the subsoil of the Norfolk loam is a highly plastic silty or very fine sandy clay, ranging in color from yellow to light reddish brown. In the lower part there is more or less grayish mottling, shading to the light gray of the unweathered clay beneath.

These heavy phases of the Norfolk soils are frequently found on the steeper slopes. They also occur on the crests of some of the divides, usually as flat areas of rather limited extent, where the effect of the poor underdrainage is apparent in the light-gray tint of the soil and the pale yellow of the subsoil.

In general the topography of this phase ranges from undulating to moderately hilly. Only a small proportion is unfit for cultivation.

The original forest growth was an almost pure stand of longleaf pine. Over extensive areas the cutting of this timber has been so complete that the country is comparatively open. On account of the freedom from underbrush and small timber, as well as the preference of the native grasses for the heavy soils, all of this type affords fine grazing.

This phase of the Norfolk loam has an extensive distribution in this county, areas of greater or less extent occurring in each township. The largest area forms a somewhat irregular belt reaching nearly across the middle of the county. It embraces most of the divide between the Leaf River and Black Creek. The Norfolk soil occurs chiefly on the southern slope. Much of its surface is gently rolling, with more hilly land at the heads of the streams. Many of the areas on the southern margin of this tract merge into the Meadow or Kalmia types on the lower courses of the creeks. The northern

border changes rather abruptly to the hilly phase of the Ruston sandy loam and associated types. Most of this tract is high, well-drained land, admirably adapted to general farming.

Between Epps and Rosine a gravelly phase of the Norfolk loam occurs. The surface is irregularly rolling and inclined in places to "bumpy" topography of moderate relief, with somewhat higher and steeper hills along the small branches. On most of the hills, and also on some of the milder slopes, there is a good deal of quartzic gravel and more iron concretions than are usually observed elsewhere. This soil is more sandy than the normal phases of the type, and the lower subsoil is frequently a hard reddish-yellow sandy clay.

The occurrence of gravel is not uncommon in the rolling phase, but it is usually confined to the most hilly land.

South of Black Creek much of the Norfolk type is associated with minor areas of the Susquehanna soil. Along the Gulf & Ship Island Railroad in this locality there are numerous local developments of heavy soils not clearly representative of either type. The extensive area between the Columbia Branch of the above-named road and the south line of the county is undulatory to very moderately rolling. The soil in general is very similar to that of the level or typical phase.

From Bon Homme northwest to the limits of the county the Susquehanna silt loam and the rolling phase of the Norfolk loam are the predominant soils. The latter is generally underlain by the heavy clay from which the former is directly derived. Consequently the Norfolk averages heavier in texture than the soils of the large areas farther south, and any other departures from the type features are toward the Susquehanna characteristics. There are necessarily frequent transitions from one soil to the other that can not be shown on the map. The doubtful phases have usually been grouped with Susquehanna.

Practically all of the Norfolk has good surface drainage, and the heavy substratum lies too deep to affect seriously the underdrainage, except in occasional areas of limited extent.

The rolling phase of the Norfolk loam has the same crop adaptations and fertilizer requirements as the typical phase, with such modifications as may be due to its somewhat superior natural drainage. More favorable locations for fruit and truck growing may be found, the slight variations in depth and texture of the soil affording suitable conditions for a rather wide range of such crops. The higher ground is also less subject to frosts.

The present price of unimproved Norfolk loam is extremely variable. Small tracts which include but little waste land range from $5 to $20 an acre, the higher figure being for desirably located land in the rather limited areas of the typical phase. Most of the rolling

phase ranges from $5 to $10, except near the larger towns, where much higher values prevail. Improved land is worth from $20 to $40 an acre.

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

Mechanical analyses of Norfolk 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.*
421911, 421915, 421968.	Soil.....	0.4	1.3	4.3	20.3	14.8	50.7	8.3
421912, 421916, 421969.	Subsoil.....	.1	.9	4.1	16.8	12.9	43.1	21.8

NORFOLK SAND.

To a depth of a foot or more the Norfolk sand is an incoherent sand, principally quartz, varying in color from a bleached gray to light grayish brown or pale yellow. The subsoil is usually a grayish yellow or pale yellow sand containing some interstitial material in the lower part.

Several small areas occur in the southern townships. Some of them are very much like the lightest phases of the Ruston sand, although the reddish tints and loamy character of the latter are not observable in the 3-foot soil section. At greater depths, however, the sand is red and usually contains more or less silt and clay. Most of the area south of Beaver Dam Creek is a sand hill, the loose, gray sand having a ridged, or "hummocky," surface, suggestive of drift by the wind. A few miles southwest of Maxie there are several sand hills of moderate height, having a scanty covering of grass with some cacti and Spanish bayonet.

The lower lying portions of this type have some agricultural value, and with liberal fertilization might be utilized in the production of early truck crops.

SUSQUEHANNA SILT LOAM.

To an average depth of 6 inches the soil of the Susquehanna silt loam varies from a silt loam to very fine sandy loam. It is the predominance of the latter grade of soil particles that gives the soil the fine gritty feel so noticeable when a sample of it is handled. While the silt content is usually high, and there is a perceptible amount of clay, the degree of coherency is low. In most instances there is a marked absence of that friability or loaminess observable in soils

containing so much silt. This is due in a large measure to the scarcity of humus, and also to the almost total lack of red and brown oxides of iron, which tend to increase the coherency of the mineral particles in soils. Usually the coarser soil grains in this type are free from any ferruginous coating, and undoubtedly the same is true of the finer particles, accounting for the characteristic light-gray color. In some places where the drainage is particularly poor the soil has a floury feel when dry. It becomes a whitish mud when wet.

The line of contact between soil and subsoil is generally well defined. The upper portion of the latter is usually a light-brown or yellow fine sandy clay, changing with slight increase of depth to red clay. In the lower subsoil the color is mottled red, brown, and gray with a decided increase of the gray tints at 3 or 4 feet from the surface. In the heaviest phases the latter depth includes the practically unweathered upper portion of the parent material, a heavy bedded clay.

That part of the subsoil above the red zone, where the latter does not immediately underlie the soil, is more or less permeable and inclined to be crumbly, but the brighter-colored material below is a close, tenacious, and sticky clay when wet. When dry it assumes a finely divided granular structure—the characteristic form of this clay where solution and oxidation have affected it to a considerable extent. In the lower subsoil, where weathering has not yet proceeded, the clay is checked into angular fragments, or, less frequently, into roughly cubical granules. This granulation disappears almost entirely when the clay becomes saturated, so that under such conditions the subsoil proper is about as resistant to any downward movement of water as the unweathered clay beneath. Where there is more than the average amount of sand in the clay there is usually less mottling in the subsoil. The structure of the upper portion is "grainy" rather than granular, and moisture conditions generally better than in the mottled phases of the partially weathered clay.

The Susquehanna silt loam is typically developed on the low hills west of Hattiesburg and in most of the large area southwest of Rawles Springs. Small areas occur in the central and southern townships, usually in rather close association with the Norfolk loam.

The surface is rolling to moderately hilly. The topography of the larger areas is characterized by easier curves and gentler slopes than usually prevail on most of the upland types.

Susquehanna silt loam, rolling phase.—A rougher phase of the Susquehanna is found in a few localities. The surface is more hilly and the soil generally coarser and of more variable depth than that of the phase just described. It usually carries some gravel, especially on the steeper slopes. The upper part of the subsoil may be more or less sandy, but the lower portion is a heavy clay.

The largest areas of this rolling phase are indicated upon the map by cross lines. They include some tillable land on the crests of the ridges where the soil resembles the Ruston sandy loam.

The soil of the Susquehanna silt loam is highly siliceous, as may be inferred from its origin. The subsoil evidently contains a low proportion of the more easily soluble mineral constituents. The chief cause of the low productiveness is unfavorable moisture conditions induced by the impervious nature of the lower subsoil. There is not sufficiently free circulation of air and water to release in assimilable form such elements of plant food as may be present. The light color of the surface soil is caused primarily by the frequent changes from saturation to comparative dryness to which it is subjected.

Only a small proportion of this type is cultivated. The farms that have been opened up consist largely of the yellowish phases or those approaching the Norfolk loam in general appearance of the soil and upper subsoil. In rather dry seasons, or if the rainfall is well distributed, crops make a satisfactory growth, but the effect of continued wet weather is very apparent in corn and cotton patches, especially if the precipitation occurs early in the season.

In the management of this type the first essential is as thorough drainage as can be secured. While in most places the surface drainage is good, there are occasional instances where seepage from higher ground should be cut off by properly located ditches. In the heaviest phases, where red clay is found at the grass roots, open ditches will not make a very marked improvement. Tiles would also prove unsatisfactory in the heavy, red clay for the structure is so close that effective drainage would extend but a very short distance to either side. Where the subsoil is a little more sandy, or is decidedly granular, tiling would effect a much greater change in the average moisture conditions.

The incorporation of very liberal amounts of organic matter is especially beneficial to a soil of this kind. The physical condition is greatly improved since the grayish color and lack of coherency in the mineral constituents disappears with the presence of humus. Lime is also a highly desirable addition as it favors the flocculation of the clay particles with which it comes in contact. Rather large applications should be made, several thousand pounds to the acre, to affect the structure of the soil materially. This mineral, however, should always be used in conjunction with humus forming materials such as vegetable matter or coarse manure.

In the selection of any of this type for general farming those phases approaching the Norfolk soils are to be preferred. Where the tenacious red clay is found at a depth of less than 2½ feet the cultivation of the soil will be attended with considerable difficulty.

Most of this type is well adapted to grasses and forage crops requiring little tillage. There seems to be no reason why excellent permanent pastures could not be established. Lespedeza, Bermuda grass, and carpet grass all seem to thrive wherever the original vegetation has been destroyed.

The larger areas are cut over land on which, as a rule, the pine stumps are somewhat smaller than those on the lighter type. In many places the formerly scattering undergrowth of black-jack oak is becoming very thick, to the detriment of the otherwise excellent grazing that these areas afford.

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

Mechanical analyses of Susquehanna 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.*
421923, 421941	Soil	0.2	0.5	2.8	15.8	28.0	47.2	4.7
421924, 421942	Subsoil	.0	.1	.3	2.6	17.2	39.7	39.9

RUSTON GRAVELLY SANDY LOAM.

The soil of the Ruston gravelly sandy loam consists of 10 to 15 inches of loamy sand to light sandy loam, in which the coarser grades of sand predominate. Frequently the first few inches consist almost entirely of sand but as a rule contain more or less silt and clay, the proportion of these finer constituents increasing with depth. The color ranges from light gray, where the texture is so open as to admit of comparatively thorough leaching, to some shade of brown or red, where the material is heavier.

There is generally an abundance of gravel upon the surface, chiefly small chert and quartz pebbles with some iron concretions and rarely fragments of iron conglomerate. This stony material is most in evidence upon the crests and upper slopes of the steep hillsides, where the type usually occurs. In some instances the gravel virtually covers the surface, and the vegetation is scanty, but in most places it is merely a coarse component of the upper soil and forms but an insignificant proportion of the middle and lower soil sections.

The latter in places is a compact dull-red sandy clay, resembling the subsoil of the heaviest phases of the Ruston sandy loam. More frequently it is a reddish-brown sandy clay becoming heavier with increase of depth. On the lower slopes, where the gravelly loam usually merges into some one of the finer textured types, the subsoil is a sandy material of more open structure.

Most of this type is of little value except for the timber and pasture. The latter is not so good as on the soils of finer texture. Many of the minor occurrences, a few acres each in extent, occurring on the points of ridges and apexes of hills, are not shown in the map.

RUSTON SAND.

The surface soil of the Ruston sand is a medium to coarse grayish quartz sand, usually carrying a small quantity of gravel. The percentage of the finer grades of sand in most places is low, and there is but little silt or clay. In the virgin soil—and but little of the type has been cleared—there is enough humus in the first few inches to give the soil a rather dark color, but below this zone the sand gradually assumes a pink color, and at 3 feet it is a pronounced red. Even the lightest phases of this sand rarely have a bleached or thoroughly weathered appearance.

In most cases the lower part of the soil section is somewhat more coherent, there being a perceptible increase in the proportion of fine material. The heaviest phases are essentially an Orangeburg sand, all the particles having a coating of red iron oxide.

The small areas of this type occur chiefly on slopes where the uplands descend to the valleys of the larger streams. The largest area is on Black Creek, near Brooklyn; a few others are found on the south side of Beaver Dam Creek, with a limited development on the hills overlooking the Leaf Valley.

The vegetation consists chiefly of small oaks. The type has but little agricultural value.

RUSTON LOAMY SAND.

The Ruston loamy sand consists usually of a fine to medium sand with enough interstitial material to render it a little less incoherent than most of the sands found in this area. While there is considerable range in the texture of the coarser constituents, and in the relative depth of the soil and subsoil, where the latter distinction can be made, the type is seldom a sandy loam, and but limited portions are as undesirable, agriculturally, as most of the material classed as sands.

The surface soil to a depth of about 12 inches is generally a fine to medium sand, the color ranging from rather light gray to a moderately dark brown where the texture is somewhat finer and there is more than the average amount of humus. In the lightest phases the immediate surface may be slightly bleached, but as a rule some tint of red or brown is quite apparent from the grass roots downward.

Most of the areas on the uplands west and southwest of McLaurin have a loamy sand to light sandy soil about a foot deep, below which there is a dull-red loamy sand to sandy loam. The latter is fre-

quently heavy enough to be crumbly, and somewhat sticky if wet. The water-holding properties are good, and such phases of the type would be classed as a sandy loam were it not that this comparatively heavy stratum, or zone, usually but a foot or two in thickness, is underlain by loose sand extending to an unknown depth. This substratum of sand has poor capillarity and is the chief cause of the droughty nature of the soil overlying it.

The surface of this phase is rolling to hilly. Some of the areas include the crests of ridges where the loamy sand merges into the Ruston sandy loam. The latter is the more valuable land for farming.

The original forest growth consisted of longleaf pine and scrubby oak. In most places the latter is becoming the characteristic timber growth.

On the margin of the uplands overlooking the Leaf Valley the soil is more variable in depth and texture. As a rule it is coarser with a good deal of gravel on the steepest slopes. The subsoil is usually a reddish loamy sand in which there is a noticeable increase in proportion of silt and clay at 25 or 30 inches below the surface. These heavier phases of the subsoil are generally red, although brown tints are common, usually where clay outcrops near by.

In general this phase of the type has but little agricultural value on account of the hilly surface. The timber is mixed pine and oak, the latter growth being heaviest in the ravines and on the better phases of the soil.

One area on the county line southeast of Maxie is a rather high ridge between north-flowing streams. The surface is lighter colored, and the material in general much finer than that of the phases just described. Some of this area is a Norfolk sand, but in most places a red sand forms the subsoil and underlying material. Some of this land lies well, but is hardly safe for cultivated crops.

Some of the other small areas in the southern townships resemble a light phase of the Ruston sandy loam, and on the limited portions now under the plow fair crops are secured.

The rather limited areas of this type that are not too hilly to be cultivated easily are better adapted to fall-sown grain or to other forage crops than to corn or cotton. Early truck would do well, but all crops requiring a long season must necessarily run some risk of injury by dry weather.

In the management of this soil the first essential is the conservation of moisture. The ground should be broken flat rather early, and in most cases not too deep; the lower soil and subsoil in most instances need compacting instead of loosening. Frequent shallow cultivation is best, and ridges should not be thrown up at any time.

Any increase in the humus supply will also improve the moisture properties.

Rather liberal fertilization will be necessary to maintain the fertility of such a sandy type. Since there is liability of loss through leaching applications should not be made too far in advance of the probable needs of the crop.

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

Mechanical analyses of Ruston loamy sand.

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.*
421981	Soil	0.3	0.9	11.8	56.0	5.4	20.5	5.0
421982	Subsoil	.0	.7	11.6	50.6	3.1	23.9	9.1

RUSTON SANDY LOAM.

To an average depth of about 12 inches the soil of the Ruston sandy loam is a moderately heavy sandy loam. The finer grades of particles are usually well represented, and there is generally enough coarse and medium sand present to give a hand sample a harsh, gritty feel. In cultivated fields the immediate surface is frequently a light sandy loam, but with slight increase of depth the soil is much more coherent, in many instances a crumbly sandy loam that may be quite compact at 8 or 10 inches from the surface.

In the first few inches of virgin soil the humus gives a decidedly dark-gray or brownish-gray color to the material. Below the influence of the vegetable matter the soil has a dull-brown or reddish-brown tint.

The subsoil is not usually uniform in structure throughout. In most instances it is a reddish-brown sandy loam in which with increase of depth the red tint becomes more pronounced and the structure of the material considerably more compact. The latter condition is due to the increasing proportion of clay and iron oxide. In the heavier phases the lower part of the subsoil may be a sticky sandy clay loam or sandy clay, but as a rule there is so much moderately coarse sand in it that the material is quite porous and crumbles when a sample of it is handled.

The extreme basal portion of the subsoil is most commonly a reddish loamy sand that at 4 or 5 feet from the surface may be barely coherent. In some places the underlying stratum is not so light, but in the average structure of the type the heaviest zone is encountered between the depths of 18 and 30 inches.

The Ruston sandy loam occurs chiefly in the southern and central townships. The individual areas seldom exceed a few hundred acres in extent, and most of them are found on the crests of the higher divides. In many instances the surface of a field may be quite level along the axis of the ridge, or even include a well-defined depression in which the soil is dark and loamy, while on either side there is a gentle roll to the adjoining hilly phase of the type. The areas south of Beaver Dam Creek are gently rolling and the general elevation is about the same as that of the Norfolk loam. The soil is also finer textured than in the normal phase of the type. Near McLaurin the soil is light and inclined to be coarse textured, in places resembling a very light Orangeburg sandy loam. In all of the areas indicated upon the map there are frequent variations in color or other physical characteristics, but in most instances the type is distinct, being known by farmers as "Red land."

On account of a general prevalence of a sandy substratum the underdrainage of this type is excellent. In some cases it may be a little more effective than is desirable, excess water escaping readily by gravity, but failing to return on account of the poor capillarity of the sandy material below. It is also possible that in the lighter phases a slight leaching may occur in wet seasons, but seldom to any serious extent.

In most of the type the physical conditions admit of the maintenance of good moisture conditions. This, of course, may be modified by methods of tillage. In many old fields a hardened layer is found just below the loose surface soil, caused by continuous shallow plowing. This condition and the exhaustion of the humus are accountable for the low average yields of corn and cotton on much of this land.

This type should generally be managed with a view to conserving moisture. Deep, early plowing is commended and shallow cultivation should be given most crops. Since the underdrainage is very effective, there is little liability of this soil continuing wet for any length of time. On the contrary, the supply of reserve moisture, which in the lighter phases is virtually limited to that held in the subsoil proper, may prove inadequate for the needs of a crop approaching maturity.

The average yield of cotton is less than 1 bale per acre, while that of corn varies from 20 to 25 bushels. Sugar cane and sweet potatoes do well, and also other truck crops, but the total acreage of these products is small.

A considerable proportion of this type is included in small homesteads, the value of which ranges from $20 to $40 an acre. In many instances small farms consist for the most part of the hilly phase of

the type, the cultivated land being a rather limited area of the better phase, usually the narrow crest of a ridge.

Ruston sandy loam, rolling phase.—A rolling phase of the Ruston sandy loam has an extensive distribution throughout the county. It is the dominant soil phase of most of the rolling to hilly lands along the larger creeks and their principal tributaries. Areas of considerable size are found upon some of the high interstream divides forming the elevated portions of the central townships. It has also been developed, although not extensively, on the margins of the uplands overlooking the Leaf River Valley.

While the surface of much of this phase is decidedly hilly, most of it may be described as heavy rolling. The crests of the narrow ridges in many instances afford limited areas nearly level in the direction of their axes, but usually decline on each side to moderately steep slopes. In general the milder topography prevails where the Ruston soil is associated with the Norfolk types, and the roughest land is found near the Ruston gravelly sandy loam.

In a phase of such varied surface features the soil necessarily has considerable range in texture, depth, and color, with a little more uniformity in the general character of the subsoil. In most places the immediate surface material is a brownish-gray or light reddish brown medium to coarse sand. With increase of depth there is usually more fine sand and silt and the red color becomes quite pronounced. There is generally some gravel, but it is seldom abundant except in spots on the steepest hills. In those areas adjoining the Norfolk types the soil on the ridges is usually a fine sandy loam with a yellowish clay subsoil.

As a rule the subsoil of this phase is a very light red or brownish-red sandy loam that grades in the lower part to heavier material—a red sandy clay. In the neighborhood of the Susquehanna and Norfolk types it is a clay or clay loam, while in the vicinity of areas of light soils the subsoil of the Ruston sandy loam is generally a reddish sandy material of loose structure to a depth of several feet.

The characteristic forest growth is longleaf pine and several species of small oak, the latter most numerous where the soil is lightest. In some places scrubby blackjack oaks are quite abundant on the shoulders of hills where the soil is exceptionally thin and the subsoil a heavy clay. In the ravines the timber is larger and includes some hickory, poplar, and a few other varieties. Along the branches narrow strips of semiswampy ground occur, usually covered with trees and brush.

Pasturage on this phase is inferior to that on the heavier soils, particularly in dry seasons.

The greater part of this phase of the Ruston sandy loam is topographically unfit for farming. On the widest divides small areas,

usually less than 20 acres in a body, may be found having about the same surface features and agricultural value as the better phase of the type. As already mentioned, very limited areas also occur resembling the rolling phase of the Norfolk loam. The suggestions concerning the management of these types apply equally well to such portions of this phase as may be brought under cultivation, except that terracing will be necessary. Practically all of this soil is better adapted to pasture or forestry than to agriculture.

RUSTON FINE SANDY LOAM.

The Ruston fine sandy loam is intermediate between the rolling phase of the Norfolk loam and the Ruston sandy loam. It possesses to a considerable extent the characteristics of each, but in most instances is sufficiently differentiated from either to warrant its recognition as a separate type. The individual areas, however, are difficult to outline with any degree of accuracy, while the smaller ones are not sufficiently large to map. Most of the larger developments of the type are not very uniform with regard to the texture of the soil or the color of the subsoil.

In most instances the former is a fine sandy loam, while the latter ranges from a light yellowish-brown loam of fine texture to a dull-red "grainy" material resembling the subsoil of the Orangeburg types. In most instances the subsoil is a yellowish-brown fine sandy loam, changing at a depth of 20 or 30 inches to a dull yellowish red fine sandy clay. The underlying material is usually rather coarse textured, as indicated by the tendency toward red and brown tints, and insures good underdrainage to the subsoil.

As a rule the soil is quite similar to that of the Norfolk loam, possibly a little coarser and of greater average depth. The somewhat higher coloration of the subsoil indicates a little better aeration and underdrainage than most of the Norfolk soils possess. The difference is not marked, however, except in those phases that are essentially an Orangeburg soil. The changes so frequently observable in the same field are caused chiefly by variations in the structure of the subsoil and underlying stratum.

The topography varies from rolling to moderately hilly. In a few places some gravel and a little concretionary material is found, but practically all this type is easily tillable. Many farmers prefer this land to the Norfolk loam. It stands wet weather better and approaches the red soils in crop adaptations and general agricultural value.

CAHABA SAND.

The surface of the Cahaba sand is a medium, rather sharp quartz sand, with a sprinkling of small gravel. The color is dull gray to

grayish brown, but at a depth of a few inches there is generally a prounounced brownish cast. The material is rarely light colored or bleached. There is generally a perceptible quantity of fine material, and in some places the first few inches is somewhat loamy.

The subsoil, beginning at about 6 inches, is a medium to coarse sand, generally quite loose, but occasionally feebly cohering, on account of the presence of a little clay and the iron oxide that so commonly covers the sand grains. Grayish brown to rather bright reddish brown are the prevailing colors, the latter being most frequently observed in those shallow phases resting upon a sandy clay substratum. In most places the underlying material is a very coarse sand or gravel. It is often exposed in shallow excavations or brought to the surface by overturned trees.

The Cahaba sand usually occurs as very low ridges in areas of loamy sand. Only the larger areas are indicated on the map. The native vegetation consists chiefly of scrubby oak and a sparse growth of grass.

CAHABA FINE SAND.

The surface soil of the Cahaba fine sand to an average depth of about 8 inches consists of a dark-gray to brownish-gray fine sand, with enough silt to give it a rather loamy appearance. The subsoil is variable, ranging from reddish-brown, loose, loamy fine sand to red light fine sandy loam in the lower portion, the color varying according to moisture conditions.

The surface sand usually consists almost entirely of quartz grains, with a slight proportion of particles of iron oxide and other minerals. In the depressions it is frequently quite dark colored. In the portions accessible along Tallahala Creek when this survey was made the soil ranges from a dark-brown loamy sand of moderately high agricultural value to a fine sandy loam.

The areas along Bouie River represent comparatively recent accumulations of alluvium. They usually occur near the channel, extending but a fourth of a mile or less back from the stream.

The surface of the type is somewhat uneven, consisting of low, irregular swells and shallow depressions. The general level of the fields near Mammoth Springs is about 25 feet above low-water mark, and they are rarely overflowed. The larger area on Tallahala Creek is more frequently inundated.

Some of the type is under cultivation, the best phases giving fair yields of corn and cotton. The yields on the lightest sand are very uncertain. Most of the areas of the type found along Bouie River are of little agricultural value, the sandy subsoil ranging in depth from 2 to 2½ feet. Along Tallahala Creek most of the soil is better suited to cultivation.

CAHABA LOAMY SAND.

The Cahaba loamy sand, to an average depth of 10 inches, consists of a grayish-brown loamy sand, usually of medium grade, except upon the low swells or ridges, where the material is slightly coarser. An admixture of silt and clay, occasionally with moderate quantities of organic matter, is found in the depressions, where the soil is often quite dark and loamy.

The subsoil to an average depth of several feet is a loose reddish-brown medium to coarse loamy sand, usually carrying enough interstitial material to give it a noticeable degree of coherency. Frequently the lower portion is a light sandy loam, fairly retentive of moisture.

Considering the 3-foot section as a whole, the type is extremely variable. Near the contacts with the Ocklocknee and Kalmia soils heavy material is usually found at a depth of a few feet. On the low ridges and along creek banks the sand is generally much deeper, though there is no consistent relationship between depth and topography.

The type occurs on the lower terrace of Leaf and Bouie Rivers. Some of the lower portion is subject to overflow, but the greater part lies well above ordinary floods. The natural drainage is generally good. On some of the flat areas, and also in a few of the depressions, artificial drains are necessary, a condition indicated by the grayish color of the subsoil.

While this alluvial material consists very largely of quartz sand, there are some other minerals present, and apparently a rather high content of iron. Under some conditions the sand and included material is a pronounced red. The more loamy phases have a rather high degree of inherent fertility, considering the coarse texture, but the latter characteristic renders the moisture content uncertain. The controling factor in this case is the depth to material sufficiently heavy to retain moisture.

About half of this type is cultivated. On the best phases the yield of cotton is more than 1 bale per acre, but rather liberal fertilization is necessary. Corn does well in the loamy depressions, but the type as a whole is too low in humus to give heavy average yields of this crop. Much of it is a warm, early soil, well adapted to sweet potatoes, watermelons, and other truck crops.

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

Mechanical analyses of Cahaba loamy sand.

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.*
421927, 421964.....	Soil.....	0.6	9.5	26.5	39.9	5.1	12.6	5.2
421928, 421965.....	Subsoil.....	.6	7.9	21.1	40.3	4.4	16.6	8.2

CAHABA SANDY LOAM.

The phase of the Cahaba sandy loam occurring on the lower terraces is quite similar in surface appearance to the Cahaba loamy sand. In the areas mapped as a sandy loam, however, a comparatively heavy subsoil is found usually at less than 20 inches. It is generally a reddish-brown to dull-red sandy loam or, occasionally, sticky sandy clay. It is most compact at 3 or 4 feet below the surface, grading thence into sand or sand and gravel. While varying considerably in composition and thickness, the heavy substratum constitutes a good moisture reservoir. The overlying surface soil consists of a brownish loamy sand to light sandy loam.

In the shallower phases, found along some of the terrace lines, deep plowing brings to the surface some of the heavier subsoil, materially improving the texture of the soil. As a rule the capillarity is fairly good, the moisture coming well up to the surface. The original supply of humus has been largely exhausted through long cultivation, so that the surface of old fields often presents a light-colored, sterile appearance. If the organic matter content were increased there would be but little need of mineral fertilizers for the usual farm crops. Sweet potatoes, watermelons, and sugar cane do well, but the color of the sirup is dark. The yields of cotton, corn, and forage crops are very satisfactory wherever good tillage is given.

No extensive areas of this type are found in either the Leaf or Bouie River Valleys. The larger ones have been mapped, but numerous smaller developments are not shown. The type is developed on low-stream terraces, but stands above normal overflow.

Cahaba sandy loam, high terrace phase.—The soil of this phase of the Cahaba sandy loam to a depth of about 12 inches is a grayish-brown sandy loam. The immediate surface is usually a rather coarse sand, with considerable interstitial material, but at a depth of a few inches it becomes heavier and more coherent, often a crumbly sandy loam.

The subsoil is a dull-red or reddish-brown sandy loam to friable sandy clay, not quite so coarse, as a rule, as the soil. Where the surface is sloping the red color is most pronounced. Areas with this red subsoil represent the most advanced stage in the weathering of this type—a stage wherein the thorough oxidation has brought the soil to resemble closely the older, thoroughly weathered Orangeburg sandy loam. Where the surface is nearly level the soil is usually a lighter shade of grayish brown and the subsoil approaches a brownish yellow.

This phase of the Cahaba sandy loam is developed on the highest stream terraces, where the drainage is well established. The total area, however, does not exceed 3.1 square miles, for in most places

the surface material of these higher benches consists principally of finer textured soils.

The largest area of this phase is found on the high terrace south of Hattiesburg. The smaller areas elsewhere on lower levels as related to the stream channels.

Truck is grown with good success on this soil. It is also well adapted to general farming, the small fields of cotton and corn now grown averaging nearly as high in yields as on the Orangeburg sandy loam. Like the latter type, it endures cultivation well and is very responsive to fertilization. With liberal applications of lime and organic matter and inoculation it is possible that alfalfa could be successfully grown.[1]

CAHABA FINE SANDY LOAM.

The surface soil of the Cahaba fine sandy loam is a light-brown to brown loamy fine sand. At a depth of a few inches the percentage of silt and clay increases, so that the lower part of the soil becomes a friable fine sandy loam, varying from brown to light reddish brown in color. The organic matter content is not high, but even a small amount has the effect of perceptibly darkening the soil.

At 10 to 15 inches below the surface the material is generally a rather firm, hard fine sandy loam. There is considerable variation in this respect, however, for the subsoil of some of the areas adjoining the Ocklocknee soils is a heavy clay loam or fine sandy clay loam, while near the coarser Cahaba types it is often found to be a light, fine sandy loam. The dominant color is reddish brown to dull red. There is a substratum of comparatively loose, reddish fine sand or sand, which changes below to gravel. This coarser-textured material is usually encountered at depths between 3 and 6 feet.

Most of this type occurs on terraces of moderate elevation. In the Leaf Valley small areas are occasionally overflowed, but the surface in general is from 10 to 20 feet above the limit of ordinary floods. The small areas on the west side of the Bouie Valley are simply the better drained portions of low bench lands and the type merges imperceptibly into the adjoining Kalmia soils. The areas near the channel are on a lower level, but the drainage is generally good and the surface rarely inundated.

The greater part of this type is cultivated, some of the most desirable farm lands in the valleys being the high terrace phase of Cahaba fine sandy loam. On well-tilled ground the average yield of cotton is about 1 bale per acre, of corn from 20 to 50 bushels. Alfalfa probably could be successfully grown with liberal additions of lime and organic matter. Cowpeas, oats, soy beans, and peanuts

[1] Farmers' Bul. No. 339.

do well. On many farms, particularly those cultivated by negroes, shallow plowing has been so long practiced and the humus is so exhausted that the returns are below the estimates stated. With the possible exception of the limited areas underlain by clay loam to a considerable depth, this soil should be managed with a view of conserving moisture. It holds moisture well when properly handled, especially when plowed deeply and liberally supplied with organic matter. Deep winter plowing and frequent shallow cultivation will insure the best moisture conditions obtainable in the average season.

Cahaba fine sandy loam, high terrace phase.—Some areas of the Cahaba fine sandy loam are indicated on the map as high terrace phases of the type. The distinction is somewhat arbitrary, but usually the latter lie from 20 to 40 feet above the first bottom lands. Nearly all of this phase consists of well-improved farms ranging in value from $30 to $50 an acre, which is somewhat more than the average price of similar land on the lower benches. Practically all of this phase has a high agricultural value, with about the same crop adaptations as the main body of the type. Some of it is similar in color to the Orangeburg sandy loam, owing to the more effective drainage and complete oxidation to which the materials have been subjected.

The following table gives the average results of mechanical analyses of samples of the soil and subsoil of the Cahaba fine sandy loam:

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.*
421956, 421960.....	Soil.....	0.2	0.8	5.0	31.5	24.8	32.6	5.0
421957, 421961.....	Subsoil.....	.0	.4	3.9	25.3	17.9	35.8	16.2

CAHABA SILT LOAM.

The Cahaba silt loam, to a depth of 6 or 8 inches, is usually a dark-brown or reddish-brown silty loam, in places approaching a sandy loam in the surface few inches. Underlying this is a rather compact silt loam, which grades below into reddish silty clay. At a few feet below the surface sand is generally encountered.

As a rule this soil has the properties of loam, particularly in old fields which have been plowed so thoroughly as to mix the surface materials. In most places the soil is inclined to be cloddy, owing to the exhaustion of humus. Gravel is frequently found along the margins of low terraces occupied by this type and on such well-drained situations the soil is more nearly red, owing to better aeration and oxidation.

The type is developed chiefly as low stream terraces that have a little better elevation than the recent alluvial soils. All of it is subject to occasional overflow, but most of the areas indicated upon the map are flooded only during exceptionally high waters and then but for short periods.

There is not much of this type, considering it as a whole, that has not good aeration and internal drainage to a depth sufficient to render it suitable for most cultivated crops. In some of the areas shown upon the map there are rather numerous spots where the subsoil at a foot or two below the surface is very light colored, indicating lack of drainage. This is caused in most cases by the compact structure of the subsoil and partly by topographic position, for the surface is more or less uneven. In all instances the average conditions with respect to the moisture content are pretty well indicated by the coloration—best where the material is brown or slightly reddish-brown to a depth of several feet and least desirable where light tints of gray prevail within a foot or so of the surface. The presence of the sandy substratum undoubtedly exerts a very favorable effect upon the average moisture conditions of the greater part of this type.

Most of this soil is cultivated and good yields of corn and cotton are secured without fertilization. It is not so early a soil as the more sandy types and under boll-weevil conditions would be found not so satisfactory for cotton. Early maturing varieties only should be planted on this land if the boll weevil becomes a serious menace. Alfalfa would do well on those phases where the depth to the water table is at least 5 or 6 feet. Practically all of the type is well adapted to grass and forage crops.

This type represents the best drained and most easily tilled portions of the lower bottom lands. Its agricultural value is about the same as that of much of the Ocklocknee soils on the Leaf River.

KALMIA FINE SAND.

The Kalmia fine sand consists of a moderately dark gray fine sand, underlain by a dull-gray to pale-yellow fine sand, containing some silt and clay and grading below into a gray to nearly white, loose, sharp sand, in many places as clean as that found in stream channels. The first few inches of the surface soil usually carry considerable organic matter, giving it a slightly loamy texture.

The depth of the sand is variable, being usually greatest near the banks of the creeks and becoming less a short distance back, where it merges into types of heavier texture. Exposures on Black Creek show some 8 or 10 feet of comparatively clean sand resting upon clay.

The type is of limited extent, occurring on Black Creek and its larger tributaries. Practically all is occasionally overflowed, but since the surface is from 10 to 15 feet above the normal level of the streams the drainage is good.

A few small fields under cultivation give poor returns. The soil consists very largely of quartz sand, a fact that shows the necessity of fertilizing for favorable yields. The moisture content is uncertain, owing to the openness of the soil.

KALMIA LOAM.

In most of the larger areas of the Kalmia loam the soil to a depth of about a foot consists of a fine-textured loam. Light gray to yellowish gray are the prevailing tints below the immediate surface layer, which may contain considerable humus. As a rule, there is not much organic matter and its effect is confined to the first few inches of the soil. In its normal development the subsoil is a light yellow silty loam. Those areas having the best drainage incline to brownish yellow or very frequently merge into brown tints along the banks of small streams, if the latter have well-defined channels. Where the drainage is poor either on account of flat surface or the occurrence of a semi-impervious substratum the color of the subsoil is lighter, ranging from pale yellow to nearly white, with more or less mottling in the lower portions.

In most instances the subsoil contains a high percentage of the finer soil particles and but moderate amounts of the coarser grades. It is slightly plastic and there is usually a feeble development of the crumb structure so desirable in all clayey subsoils. The physical conditions in this respect, however, would improve if better drainage were established.

The Kalmia loam includes much of the recent alluvium on the smaller branches and considerable tracts of first bottom land along the larger creeks. It also embraces a good deal of the level land on the lower terraces of Leaf and Bouie Rivers. It is distinguished by the generally level surface and the drainage conditions induced by such topography.

While a comparison of the mineralogical composition of the soil material presents noticeable differences, when the soil of an area in one section of the county is compared with that of another, and there are innumerable local variations in color and texture easily apparent, there is generally a marked similarity in the surface appearance of all this land. In most instances it is covered with a rather open forest of pine, in which the shortleaf varieties predominate. The hardwoods consist chiefly of oaks of inferior size and quality. There is generally a good undergrowth of grass and many small gallberry

bushes, with a scattering of other shrubs that prefer wet soils. The latter species, as well as the gallberry, are largest and most numerous where the surface drainage is poorest. On the other hand, a clean covering of grass and an exceptionally thin stand of pine is often observed where the underdrainage is very ineffective.

The narrow strips of Kalmia soil on the small branches are usually a medium sandy loam near the foot of the hills, becoming finer in texture as the Meadow is approached. Along the larger streams the conditions are generally reversed; that is, the coarsest textured soil is found near the channel, while at the base of the hills it is much finer and the drainage generally less satisfactory.

The large area of Kalmia loam at the junction of Big Creek and Bouie River has a moderate elevation above the streams and contains some fairly well-drained land. The phase on Black Creek is essentially first-bottom land, the deep channel of the stream preventing extensive overflows except under unusual weather conditions. The soil is fine textured, in many places a silty loam with a heavy, close subsoil. Drainage is so poor that ditching would be required to put the land in the proper condition for crop use.

Compared with the total width of the valleys, the development of this phase of the Kalmia loam near the Leaf and Bouie Rivers is rather limited in extent. Most of the areas occur some distance back from the overflow lands. The natural drainage is generally best near the margin of the terrace, while the wettest ground is found at the base of the next higher terrace or the foot of the adjoining hills. In most places in these terraces sand and gravel is found at a depth of a few yards.

The small area of this type now cultivated has somewhat better natural drainage than the adjoining land. This is generally due to slightly greater elevation, but also in some instances to a more permeable subsoil. The latter is a factor of great importance in determining the agricultural value of any of this type. In uncultivated fields small spots of heavy soil are often found that give much trouble in wet seasons. On the normal areas the average returns compare favorably with those of the level upland types. Some artificial drainage is necessary, however, and ridge cultivation is practiced.

The reclamation of most of this land is entirely feasible. Practically all of it has sufficient elevation to insure adequate fall to the main ditches without extending them very far, in most instances to the nearest natural drainage line or area of Ocklocknee soil. If relieved of excess surface water, the soil would respond well to tillage and fertilization. Those phases approaching the Myatt silt loam would be slowest in yielding to any improvement on account of the close nature of the subsoil.

The areas on the small streams in the southern townships are for the most part a transition between the gently sloping uplands and the narrow strips of Meadow. The soil here is generally a fine sandy loam with a yellowish silty subsoil.

Exclusive of the timber, land of the typical Kalmia loam is now considered of little value except for pasture.

Kalmia loam, high terrace phase.—The soil of this phase in places resembles that of the typical Norfolk loam. It ranges from a fine sandy loam to a silt loam. The prevailing texture is a loam of fine texture, very friable and easily tilled. The humus content is usually sufficient to give a dark-gray tint to the otherwise yellowish-gray material. The subsoil is a yellow silty loam, usually streaked with some bright iron strains and often mottled with gray in the lower part. Mottling is the more pronounced where the local drainage is poorest.

This phase of the Kalmia loam is found on the higher terraces of the larger streams. In most instances it occurs in somewhat larger bodies than the individual tracts of the typical soil as found on the lower terraces. The general elevation above the latter ranges from 25 to 50 feet. A rather small area is level, but most of the surface is undulating, becoming more or less rolling as the base of the adjoining upland is approached. As a rule the natural drainage is better than that of the low terraces, and the average value as farming land is much higher.

A considerable proportion of this land is cultivated. In the vicinity of Hattiesburg much of it is included in small fields and gardens. The yields of truck, corn, and cotton are very satisfactory. All of this soil requires rather liberal fertilization and in places artificial drainage is necessary. It responds well to the latter improvement, except in occasional spots where the subsoil is a compact silty clay.

The large area near Brooklyn is a high terrace and most of the undulating surface is excellent farm land. The areas northeast of McCallum occur on a series of benches rising to a considerable height above the land near the river, but the terraces are not everywhere well defined. Much of the local change in elevation occurs in low terraces or gradual slopes. The drainage is generally good and much of this land is cultivated.

Most of the areas elsewhere have but a moderate elevation above the adjoining alluvial land. It is sufficient, however, in most cases to give good surface drainage and such soils are generally uncultivated. In surface appearance and adaptability to the ordinary farm crops the soil is quite similar to the gently rolling phases of the Norfolk types.

The mechanical analyses of samples of the soil, subsoil, and lower subsoil of this type gave the following results:

Mechanical analyses of Kalmia 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.*
421951	Soil	0.3	0.9	1.3	16.5	24.7	50.0	6.1
421952	Subsoil	.2	.6	.9	13.9	18.4	48.1	17.8
421953	Lower subsoil.	.0	.3	.9	19.2	23.6	41.6	14.3

LEAF FINE SANDY LOAM.

The Leaf fine sandy loam, to a depth of 6 or 8 inches, consists of a light-gray fine sandy loam, in which there is usually a small percentage of medium sand. The surface of fields that have been in cultivation several years frequently presents a rather ashy appearance, owing chiefly to the high content of silt and the meagerness of the humus supply. In uncleared land the content of vegetable matter may be very high in the first few inches, so that the surface is black, but just below this superficial layer the mineral constituents are almost white, in many instances as loose and pulverulent as the soil of the Myatt silt loam.

The subsoil is a stiff, firm clay, difficult to penetrate with any implement. It grades downward into plastic clay, which when dry is rather hard and somewhat brittle, especially in the lower part, where, on account of the imperviousness of the material above, the clay is often comparatively dry. In many instances this clay contains considerable sharp sand, but this does not seem to increase the porosity in any marked degree.

The color of the subsoil ranges from a light gray, or almost a steel gray in the heaviest phases, with some brownish iron stains, to mottled red and gray or mottled red and yellow. The coloration is usually indicative of poor underdrainage and aeration, from which practically all the type suffers. Occasionally small, black iron concretions are quite abundant in the soil, though not everywhere in evidence.

Several small areas of this type are found in the Leaf Valley, usually associated with heavy phases of the low-terrace Kalmia loam. It is derived from the heavy underlying clay. The surface is flat, in some places slightly depressed with respect to the adjoining land.

The southern part of the area near Petal is a heavy silt loam, decidedly light in color at the surface, while the subsoil resembles that of the Susquehanna types. On account of the limited extent, this soil was included with the fine sandy loam. Toward the north the

type merges into a more sandy phase, similar to the heaviest Cahaba soils. The area 4 miles north of Petal is on a low terrace and the outer margin has fairly good surface drainage.

A considerable proportion of this type is cultivated. In favorable seasons fair yields of corn and cotton are secured, but in wet periods crops are injured. Drainage would make some improvement, although the intractable nature of the subsoil will cause trouble in rainy seasons. Such types should be more generally used as grass lands.

Mechanical analyses of samples of the soil and subsoil of the Leaf fine sandy loam gave the following results:

Mechanical analyses of Leaf 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.*
421979	Soil	1.3	9.0	11.1	17.9	13.0	41.2	6.4
421980	Subsoil	.2	4.7	7.4	12.2	9.3	25.4	40.2

OCKLOCKNEE CLAY.

The bottom lands along the Leaf and Bouie Rivers comprise several members of the Ocklocknee series. In the survey of this county, owing to the conditions existing at the time, it was impracticable to map separately the various classes of materials. The somewhat uneven surface of this comparatively low land presents a succession of soil variations ranging from coarse sand to fine clay, distributed in that erratic manner commonly observable in the flood plains of small streams.

Compared with the total width of the valley, the belt of Ocklocknee soils on the Leaf River is narrow, while along the Bouie River their occurrence is little more than a series of isolated areas. The deep channels of these streams and the terraced topography of the bottoms prevent any widespread overflow, except under weather conditions of rare occurrence.

In many places the boundary between the Ocklocknee soils and the adjoining types is more or less arbitrary, there being nothing in the character of the surface materials or the topography to warrant a sharp separation. Very frequently, however, the limits of the land usually overflowed is marked by an old channel, whose outer bank is several feet higher than the inner one.

As a rule the surface of all this bottom land is intersected by abandoned channels in various stages of obliteration. Many of the low swells or ridges are the natural levees of these former courses of the river. A considerable portion of the surface, especially in the widest areas, is comparatively flat land, sufficiently elevated to escape all but the highest floods that usually occur. The individual areas,

however, are small, not many of them embracing more than 20 or 30 acres without the occurrence of a depression of some kind. In most instances they are partially encircled by an old channel, into which the water backs quite frequently. There are a few "lakes," or lagoons, and numerous small swampy spots filled with cypress and black gum.

Most of the level areas are tillable, although inconvenient of access. The predominant soil type is a brownish silty clay, and the name under which the whole group is described and shown on the map is that of this type. It is rather heavy and inclined to compactness, but under proper tillage could be reduced to an excellent seed bed. In some places the soil is a dark clay loam, tending to more sandy character on the low ridges near the old channels.

The subsoil is of similar texture, but usually much lighter in color, ranging from light yellowish brown to drab. An under stratum of sand is found at most points, but the depth is quite variable. It doubtless exerts considerable influence upon the moisture conditions of the soil and subsoil, for their coloration usually indicates good aeration and underdrainage.

In the depressions conditions are much less favorable, the soil being more variable in composition and the subsoil saturated so much of the time that it is very light colored. Near the river banks the prevailing material is a silty sand. A few sandy spots are found at some distance from the streams, but the most of the sediment left by the annual overflows is silt and clay.

Overflows usually occur in the winter and spring. In April, 1890, all of the Ocklocknee soils and some of the lower terraces of the adjoining types were inundated. This was exceptional, however, and has occurred but a few times within 40 years. In most instances the water, if it reaches what may be termed the flood stage, breaks over the banks into the old channels and from there more or less of the higher ground is quietly submerged. It is on the latter that most of the fine sediments are deposited. Owing to the depth and comparatively high gradient of the main channel, the floods are usually of short duration, seldom lasting more than a few days. In the "bayous" the water may remain several weeks.

The profitable utilization of such land requires that it be handled as a part of large farms, including other soil types. The cultivation of even a limited acreage of the overflow land necessitates a rather strong equipment of teams and tools, so that when conditions are favorable for work it may be done quickly and thoroughly. Much of this soil could be planted to corn as late as the middle of June with no greater risk of damage from either floods or frost than is annually assumed on extensive tracts of cultivated bottom land in other localities.

The fertility of this soil is practically inexhaustible, and it is admirably adapted to corn and grass. Its high value as pasture land and the heavy yields of hay that could be secured will doubtless result in much of this land being cleared of brush and small trees after the merchantable timber shall have been removed.

All of this land is now densely timbered. Water oak is the dominant species of hardwood in most places, with some white oak and poplar. The best of this timber, as well as of the cypress, has been removed. Beech, gum, magnolia, and bay are abundant in the lower places, and there is some pine on the higher ground. Along the river banks sycamore, maple, and willow are of common occurrence. The undergrowth consists chiefly of small trees and bushes and consequently affords but little pasture.

MYATT SILT LOAM.

The Myatt silt loam is a light-gray floury silt loam, underlain by mottled gray and yellow silty clay loam to silty clay. The type is developed in the poorest-drained situations of the stream terraces. It is locally styled "crawfish land." Very little is under cultivation. Ditching is necessary to secure proper drainage for the best agricultural use of this soil. Applications of lime would also prove beneficial. Oats, corn, grass, and Lespedeza would probably be the most profitable crops.

The flat or slightly depressed surface is generally covered with a rather thick growth of grass, and gallberry bushes are numerous. There is considerable pine, but much of it is smaller and the growth more scattering than on the associated Kalmia.

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

Mechanical analyses of Myatt 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.*
421986	Soil	0.6	0.6	1.2	4.4	10.8	73.5	8.8
421987	Subsoil	.7	.7	1.3	6.7	12.1	63.1	14.8

BIBB SILT LOAM.

In its typical development the Bibb silt loam is a very light-gray silt loam. In many instances the more clayey phases somewhat resemble putty, having a cold, clammy feel, due to lack of friability and of humus. When thoroughly saturated the soil is whitish adhesive mud; when dry it is rather firm, but not compact, the light, porous clods crushing under moderate pressure to an almost pulverulent dust.

Where the drainage is somewhat better than the average area of the type enjoys the surface resembles that of a normal soil. The subsoil is usually a yellow silty clay, white or light gray in the upper portion, and mottled with yellow spots and streaks below.

The light color and peculiar physical conditions of this type are caused by poor drainage. The surface is generally flat, and while most of the areas are not frequently overflowed, there is little chance for the escape of water except by evaporation or a very slow movement through the subsoil. There is a sensible motion of this kind, evidently, for while the water table stands practically at the surface in rainy weather, a short dry period is sufficient to lower it several feet. It is probable that in most instances there is connection with the sandy substratum generally underlying the low bench lands on which the type commonly occurs. Apparently these slow alternations from saturation to partial dryness prevent the accumulation of organic matter, either in the form in which it occurs in normal soils or in those almost permanently wet.

The largest areas of the Bibb soils are found on the flat bottoms of Black Creek. Minor developments also occur on the lowest terraces of Leaf and Bouie Rivers. In many instances the areas are too small to map, or the type characteristics are not sufficiently developed to warrant a separation from the surrounding soil—usually a Kalmia loam.

Thorough drainage is the first essential in the reclamation of this soil. In some of the heavier phases, where both soil and subsoil are a silty clay, some difficulty may be encountered in securing effective relief. Water moves so slowly through such material that even within a few feet of a ditch the subsoil may remain wet for long periods. Tile drains often prove useless in such soils, for they soon fill with silt, probably as the result of lack of granulation in the material.

The more sandy phases of this type respond promptly to drainage. While such shallow ditches as afford relief from surface water are highly beneficial it would be much better to dig them deep enough to lower the ground water at least 2 or 3 feet. This admits of better aeration of the subsoil than occurs under natural conditions, or where shallow ditches alone are depended upon.

Where well drained these light colored soils are greatly improved by applications of barnyard manure, which supplies humus and introduces beneficial soil bacteria, doubtless absent or inactive in the poorly drained soil. Lime should be used also to correct acidity.

Soils of this peculiar nature are much better adapted to grasses like redtop, carpet grass, or, if drained, to almost any of the varieties common to this section, than to cultivated crops. In many instances

drainage is especially desirable to render tillable the small spots occurring in adjoining fields of well-drained ground.

Mechanical analyses of samples of the soil and subsoil of this type gave the following results:

Mechanical analyses of Bibb 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.*
421966	Soil	0.4	0.6	0.7	4.1	13.3	66.9	14.4
421967	Subsoil	.0	1.1	1.2	5.3	7.2	58.4	25.8

MEADOW.

The areas mapped as Meadow include strips of low ground along the small branches and the lower portions of the bottom land on the larger creeks where the surface is quite frequently overflowed. It also embraces a few areas on the terraces where seepage from the adjoining hills and the lack of a definite channel for the surface drainage causes more or less saturation of the level land, varying according to the rainfall.

The latter areas, as well as those along the short tributaries that cross the terraces, are locally termed "bays." Many of the larger developments of Meadow on the creeks are very commonly called "swamps," but the surface conditions during the greater part of the year hardly justify the latter name. Much of all this low ground is comparatively dry and easily accessible except in the late winter and early spring.

The soil and subsoil of the Meadow are so variable in texture as well as in the relative proportions of mineral and organic matter that no concise description is possible. In general the material on the upper branches is more sandy than that along the lower course of the streams. Near the Kalmia soils and also where the Norfolk and Susquehanna types cover much of the uplands the Meadow is unually a black sandy loam with a heavy clay subsoil.

Wherever surface conditions are such that almost constant saturation prevails the soil is true Muck. Small spots of such material are found in almost all the larger areas, its depth seldom exceeding 1 or 2 feet.

Most of the type is densely timbered. Black gum and water oak are the dominant growth, although bay, magnolia, and spruce pine are very common. On the outer margins there is usually more or less shortleaf pine, sweet gum, various kinds of oak, and an occasional poplar, sycamore, and maple. There is generally a heavy undergrowth, although the densely shaded central portions may be quite free from brush.

The Meadow has no present agricultural value. Much of it could be partially reclaimed by simply clearing and straightening the stream channels. This would lower the average height of the ground water so that much of the present worthless undergrowth would disappear and carpet and Bermuda grass would largely take its place.

Before any considerable expense for more effective drainage than that suggested above is incurred the character of the subsoil should be ascertained. Where it is a dense clay or a very coarse sand its adaptability to any cultivated crop is questionable. The surface soil is shallow in most instances and if very mucky would largely disappear after a few years' cultivation. A Muck with a clayey subsoil usually gives more satisfactory results than a Muck underlain by sand.

The most desirable phase of this alluvium, if reclamation is considered, is a sandy loam soil with a moderately heavy sandy clay subsoil. The latter should extend without essential change in texture to a depth of several feet. A sandy substratum is desirable, and if the coloration of all the material is yellow rather than white or mottled so much the better.

Practically none of the Meadow is utilized, except for the pasturage it affords.

RIVERWASH.

On both Leaf and Bouie Rivers considerable deposits of sand and gravel are found on the inner side of many of the shorter curves. Some of these deposits are from one-eighth to one-fourth of a mile long and several hundred yards in width, including the low ground back of them, which is usually covered with willow trees. The largest of these recent accumulations are indicated upon the map, also some large gravel pits near the Bouie River above Hattiesburg.

SUMMARY.

Forrest County is located in the southeastern part of Mississippi and has an area of about 460 square miles, or 294,400 acres. The uplands are rolling to hilly, with an average elevation of about 200 feet. The valley of the Leaf River, which crosses the northeastern portion diagonally, is about 4 miles wide, including the high bench lands on each side. The greater part of the level land is included in the valleys of the larger streams.

Much of the area consists of cut-over pine land. Practically all of the remaining timber of commercial value is owned by a few lumber companies.

Compared with other industries, the agricultural development has been slow, only about 15,000 acres being under cultivation. Cotton, corn, sweet potatoes, and sugar cane are the principal crops, with a marked increase in recent years in the production of fruit and truck. The present price of improved land ranges from $10 to $15 an acre

to upward of $50; of stump land suitable for farming, from $4 or $5 to as high as $25 for especially desirable locations.

Hattiesburg, an important business center of this part of the State, is the county seat.

The mild climate and diversity of soils favor the development of general farming, stock raising, and truck growing.

Including Meadow and Riverwash, 24 soil types were mapped and separated into series; the Cahaba with 6 members, the Ruston with 5, including a rolling phase of the sandy loam, and the Norfolk series by 2 types and a rolling phase of the loam.

The types and phases occurring upon the uplands are derived from unconsolidated sands and clays of the Grand Gulf formation. Alluvial deposits of various ages have given rise to about an equal number of valley types. In all instances processes of weathering have been more important factors in soil differentiation than inherent differences in the character of the original deposits.

The Greenville loam is a very dark red soil, highly desirable for general farming. All of it is now cultivated.

The Orangeburg sandy loam is somewhat lighter colored, but is nearly equal in agricultural value to the Greenville.

The prevailing type where the uplands are undulatory to rolling is the Norfolk loam. It is adapted to general farming and to truck growing, where earliness is not of prime importance.

The Ruston series are rather light sandy soils, with reddish subsoils. Most of them are inferior agriculturally to the Orangeburg and Norfolk types. The best phase of the sandy loam, however, is a valuable soil. The rolling phase of this type is too rough for cultivation. The Ruston fine sandy loam is closely related to the Norfolk, but usually has a reddish colored subsoil.

The Susquehanna silt loam is a light-colored type, characterized by a heavy clay subsoil. It is better adapted to grass than to tilled crops.

The Cahaba series includes the red and brown alluvial soils, having good drainage. The heaviest phases are found upon the higher terraces and include some fine farming lands.

The Kalmia soils are not so well drained, the surface usually being level. They are light yellowish types similar in crop adaptation, where well drained, to the Norfolk loam.

The Ocklocknee clay embraces the overflow lands on the larger streams. Along the small branches, where the alluviam consists chiefly of material from the adjoining uplands, the ill-drained lands are mapped as Meadow. There is very little swampy land in the county. The limited areas of very poorly drained land have been included in the Myatt and Bibb series of soils.

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