SOIL SURVEY OF PIKE COUNTY, ALABAMA.

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DESCRIPTION OF THE AREA.

Pike County is located in the southeastern part of Alabama. The east side is about 35 miles from the Georgia state line, while the southern limit is at a little greater distance from the Florida-Alabama boundary. In outline the county would be nearly square if one full township which lies above the general northern boundary were placed in the northeast corner.

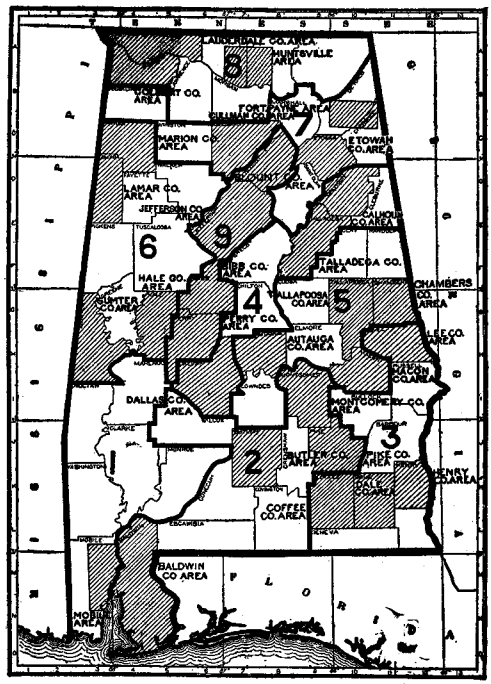

FIG. 17.—Sketch map showing location of the Pike County area, Alabama.

Bullock County bounds Pike on the northeast and Barbour on the east, the line separating the latter being Pea River. Coffee County lies on the south and Crenshaw on the west, while Montgomery is the adjoining county on the north. The total area is 675 square miles, or 432,000 acres.

The general surface inclination of Pike County is toward the south. The north line of the upper township lies a mile or so south of the Chunnenugga Ridge—the watershed between the Alabama River drainage and that which goes directly south to the Gulf. The average elevation is about 600 feet. The area is divided into two somewhat unequal divisions by the Conecuh River. The wide valley of this stream extending diagonally across the county is a marked physiographic feature. The flood plain, or "swamp" as it is locally termed, is a densely timbered belt about one-fourth mile wide at the north boundary and gradually widening to more than a mile as it approaches the south line.

To the north of the river the surface rises in very gentle slopes for 1 or 2 miles, or in many places by a series of comparatively level, open terraces of somewhat irregular width and indefinite boundaries, as regards both the line between them and between the last and the upland proper. The undulating plain upon which Goshen stands represents the best development of the terraces and is the largest area of nearly level well-drained land in the county.

With increase of distance toward the north from the Conecuh Valley the surface becomes more rolling and hilly to within 1 or 2 miles of the northern boundary. A few miles southwest of Logton, near Mannings Creek, there are some very steep, stony hills, mostly facing the north. Near Orion, on Beemans Creek, and thence southwestward for several miles toward Shellhorn most of the surface has high relief. Near the streams there are many steep slopes and the divides farther back frequently culminate in sharp elevations or narrow rocky ridges rising somewhat above the other hilltops. Near Mount Moriah Church a number of the larger hills are cone shaped and stand out in bold relief some 50 or 100 feet above the surrounding ridges.

In the sandy region to the west of these hills the slopes are generally gentler, although occasional broken areas are found. Along the south side of Patsaliga and Olustee Creeks there is some very rough land, but as the west county line is approached and also southward toward the Conecuh River, the slopes are generally longer and the larger areas of rolling or moderately hilly land are found on the main divides.

Northeast of Orion and Logton and also east of the latter point much of the surface is marked by rather long, evenly rounded ridges, since the soft calcareous rocks underlying the region have weathered more evenly than the beds of sand and clay outcropping to the south.

The northwestern half of the county is drained by a number of creeks flowing nearly due south into the Conecuh River. The largest is Mannings, the extreme upper branches of which rise in Bullock County. The streams to the east are small. Beemans and Indian Creeks on the west are not so large as Mannings, but Olustee Creek carries nearly as much water as the upper Conecuh.

All of the streams as well as most of their tributaries flow the year round. In the ravines springs are numerous and on the upland excellent water is generally to be found at less than 50 feet below the surface. In the large areas of Susquehanna soil water is not quite so easily obtained, but several fine artesian wells are located in this section.

The county roads invariably follow the main divides, and since most of the uplands are cleared there is usually an open view of the minor ridges and intervening valleys on each side. Most of the

remaining timber is found in the ravines and on the overflowed land of the larger creeks.

On the south side of the Conecuh River the hills rise abruptly from the edge of the "swamp." At a distance of a mile or so they attain an elevation of from 100 to 200 feet above the river. Few of its tributaries on this side are more than 4 or 5 miles long and all have a westerly course. From Troy northeast to the corner of the county there is much hilly land that in places consists of steep, stony hills and ridges, with areas of less broken land between, the latter being generally cultivated. Below Troy the uplands overlooking the Conecuh Valley are mostly high red hills with occasional areas of gray sandy land.

The divide between the Pea River and Conecuh drainage is almost within sight of the latter stream. Troy is situated on the crest of this watershed, and the old Three Notch Road follows it across the county. Big Creek and White Water Creek join Pea River in Coffee County.

The east central townships consist largely of high rolling ridges. The relief is generally bold, but not so great as to prevent the cultivation of nearly all the uplands. In this section the largest areas of red land occur. They usually alternate with areas of lighter surface color, so that in the spring before the crops cover the ground the landscape presents rather striking contrasts in color. This is accentuated by the narrow strips of dense green woods along the branches and occasional pine and oak groves on the hills.

On the headwaters of Richland and Buck Horn Creeks there are some very rough lands. The uplands west of Pea River generally decline gradually to the valley. There are some terraces along this stream, but they are not so extensive as those on the Conecuh River.

South of Brundidge the county is rolling to hilly, but only a small portion is too rough to be farmed conveniently. Between White Water and Big Creeks, particularly as the Coffee-Pike line is approached, the relief is stronger, there being some very high ridges in this locality. There are, however, areas of moderately rolling land on the central divides and also some very gently sloping uplands tributary to Silers Mill Creek and other small streams near Baltic and Spring Hill.

The limestone that underlies much of the surface near Henderson outcrops in many places between that point and the Coffee County line. The area drained by Bluff Creek is decidedly hilly and some of it is still covered with pine forest. Westward near the Conecuh Valley the uplands are less broken.

The creeks in the eastern and southern parts of the area are perennial, and many of the short drainage lines indicated upon the map are fed by small but unfailing springs. In all the red lands and on

most of the associated types an abundance of water is found at 20 to 50 feet, and the wells require no curbing.

In the best farming sections there are numerous well-improved farm homes, but in some localities on the largest estates, usually owned by men residing in towns, there are practically no improvements except cheap tenant houses. In general, the older homesteads are low, unpainted frame houses, built with little regard to appearance or even convenience. The farm houses erected in recent years are of much better character, and the same is true of the other improvements.

Since stock is prohibited from running at large most of the fields are unfenced.

The total population is 30,815, of which all but a little more than 6,000 is outside of the incorporated towns. The ratio of white to colored residents is about 5 to 3.

The Atlantic Coast Line Railroad crosses the county from northwest to southeast, while a branch of the Central of Georgia Railway traverses it from the northeast to southwest. Troy, the county seat, is located at the intersection of these lines. It is the principal business center, although Brundidge is the distributing point for the southeast part of the county. The population of these towns is 4,961 and 815, respectively. Banks, Pronto, and Goshen are small villages. Numerous other points designated on the map were formerly post offices, but now are merely names for settlements, although generally there is a store, church, and schoolhouse near by. Nearly all the county is served by the rural free delivery of mails and local telephone lines.

CLIMATE.

In this section of the State farming operations can be carried on during practically the entire year. Plowing for spring crops usually begins in February, although the ground can be broken during any month. The first planting of field corn may be early in March, but most of the acreage is planted several weeks later. The conditions are not generally favorable for cotton planting until the latter part of April.

Pastures and most of the native vegetation are usually well started by the middle of February. Fall-sown oats and rye remain green the entire winter, and the growth is entirely checked for only a few weeks.

A few light snowfalls may be expected each winter, but most of the precipitation is in the form of rain.

The average date of the last killing frost in the spring is March 11, and of the first in the autumn November 8. The date of the earliest severe frost in recent years is October 21, while the last in the spring occurred April 5.

The mean average temperature of the summer months, 84° F., is exceeded on a good many days in July and August, when the thermometer registers about 100° F. The long summers, while somewhat enervating, are not unhealthful. The excellent natural drainage of all the land, excepting the river bottoms, prevents any surface conditions tending to cause malaria or fevers.

The precipitation is ample for all crops, and generally the considerable loss experienced almost every year as the result of dry spells could be largely prevented on all except perhaps the lightest sandy loams and sands by proper methods of soil management. As a rule greater injury is more frequently occasioned by excessive rainfall during the earlier part of the growing season.

There being no Weather Bureau station in the county, the following table has been compiled from data taken from the records of the station located at Montgomery, which is about 40 miles northwest of Pike County. These data are applicable to Pike County, there being no essential difference in physical features in the two sections.

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

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	49	79	8	4.5	4.2	4.7	0.5
January	48	79	5	5.0	7.2	17.8	0.4
February	51	83	—5	5.0	2.0	3.0	0.8
Winter	49	.....	.....	14.5	13.4	25.5	1.7
March	58	87	21	6.3	3.6	11.9	T.
April	65	92	30	4.5	8.2	1.1	0.0
May	74	98	43	3.8	2.6	2.6	0.0
Spring	66	.....	.....	14.6	14.4	15.6	T.
June	80	106	48	4.3	5.0	3.8	0.0
July	82	107	61	4.6	0.9	9.6	0.0
August	81	103	58	4.6	2.1	7.8	0.0
Summer	81	.....	.....	13.5	8.0	21.2	0.0
September	76	99	45	2.7	0.2	2.7	0.0
October	66	96	31	2.3	2.0	0.4	0.0
Novembr	56	85	21	3.2	1.7	4.4	0.0
Fall	66	.....	.....	8.2	3.9	7.5	0.0
Year	66	107	—5	50.8	39.8	69.8	1.7

AGRICULTURE.

While many of the early settlers of Pike County came direct from Georgia or from the Carolinas, a large number moved into this region during the first decades of the eighteenth century from the counties immediately to the north and east. Most of the latter class were descendants of natives of the above-mentioned States, so that the population was distinctly southern in character. It has remained so to this time, for there has been but little immigration from northern States or foreign countries.

It is probable that the first farms were opened up near Hobdys Bridge about the year 1810 or 1812. There were also a few settlers at Orion about this date. During the next two or three decades there was a rather slow but steady increase in population. Monticello was the first county seat, but in the year 1839 the public records were moved to Troy. At this time there were quite well-established settlements in various parts of what is now Pike County, but most of the region was still an unbroken forest.

The early agriculture was decidedly primitive. In the small clearings corn, sugar cane, sweet potatoes, and garden truck were about the only crops. Cotton did not become an important product until in the late thirties. A little wheat, however, was grown in an early day, but its culture was soon abandoned.

In the rougher sections of the county the average farm holdings were small, and have remained so to this time. On the heavy red lands near Pronto and Brundidge the farms were larger, slaves were commonly owned by the wealthier families, and cotton became an important crop. In the second or third decades preceding the war there were quite extensive plantations in the eastern and southern parts of the county. In this period Orion became the residential place of a number of wealthy planters whose holdings included much of the heavy red soils in what is now Montgomery County, and also a comparatively large acreage of artificially drained bottom land on the creeks. Cotton and corn were the chief products, the former was about the only money crop and was transported by wagon to Montgomery or Eufaula.

Most of the food supplies for home use were produced on the plantations. Nearly all farmers owned cattle and hogs that ranged the woods the entire year. The pasturage in the comparatively open forest was much better than in later years. A grass locally called "wild oats" was then very abundant, but is now almost extinct. The bottoms were generally less densely timbered than at present and wild cane was the common undergrowth.

With all classes of farmers the methods of tillage were comparatively poor. The implements were chiefly small plows, and the

hoe was largely depended upon as a cultivator. The average yields of cotton are said to have been about 4 to 5 bales to the plow, 20 to 25 acres being the area that could be handled with one plow. The yields of corn, except on new land, was usually less than the present average.

After the war the comparatively high price of cotton and the lack of local markets for other products, as well as the agricultural habits of the people, naturally led to the adoption of a system of farming with cotton as the main crop. The larger land owners were forced to lease their lands, while the character of the tenants, mostly negroes, rendered wasteful and careless methods of tillage almost unavoidable.

The acreage of land abandoned was evidently not very great. Most of it has since been recleared, the principal exceptions being some overflow lands on Beemans and Mannings Creeks, and a few hundred acres of the Susquehanna clay in the same vicinity.

The methods of farming generally practiced at present are much better than they were some years ago. Further improvement can be made through the use of heavier implements and stronger teams. Much of the plowing and nearly all cultivation is done with one-horse implements. The decided advantage and greater economy of using two horses and correspondingly larger implements is not generally appreciated. On the hilly land this is not practicable in all cases, nor is it possible on plantations where negro tenants are the farmers.

On the terraced hillsides improved machinery can not always be used conveniently. On some lands the terraces now kept up could be largely dispensed with. By deeper plowing the capacity of a soil to absorb the rainfall is so increased that the tendency to surface erosion is reduced. On the lighter soils and the sandy loams when the gradient is of moderate degree terracing may not be necessary. On soils with heavy clayey subsoils that absorb water slowly the conditions are different. One successful farmer on a moderately deep phase of the Susquehanna clay that has a quite rolling surface has abandoned terracing and his fields have suffered no serious injury.

It may also be mentioned that within certain limits erosion on some sandy loams is not necessarily injurious, provided deep gullies do not form. If the first foot of loose, siliceous sand in some fields of the Ruston sandy loam and the Norfolk sandy loam could be removed bodily the land would be more amenable to permanent improvement and could be kept in better physical condition than at present. Many of the "gall spots" in fields of these types as well as on the Orangeburg sandy loam need only deep plowing and the admixture of a little organic matter to be made very productive.

The agricultural interests of this county center upon the production of cotton. The popular estimate of the worth of land, its rental

value, and the credit advanced to farmers are largely measured in terms of this staple crop. On the great majority of farms all other products are of secondary importance.

In preparing the ground for cotton a few farmers "flat break" or plow the entire field and afterwards bed up for each row. The general practice, however, consists of throwing several furrows together, the old corn or cotton rows being followed. The middle of this bed is thrown out and the fertilizer distributed in this furrow, or in some instances the fertilizer is thrown in the furrow between the beds and the dirt thrown back upon it by replowing. Later the seed is drilled in this middle to give it the immediate advantage of the fertilization.

The thinning of the young plants is all done with hoes. This chopping out is facilitated by throwing the dirt from each side of the row with a bar plow, which leaves the plants upon a ridge.

Nearly all cultivation is done with one-horse implements, such as single-shovel plows and sweeps. The former go rather deep, which of course is necessary when grass becomes troublesome or the ground is hard. The latter condition is of frequent occurrence on the Susquehanna clay and Greenville soils where the ground was plowed shallow. The sweep is more effectual in the sandy soils and its use, especially where a good seed bed is first prepared, tends to conserve moisture.

It is the general practice to "lay by" the crop in July or as soon as the plants are fairly well trenched. If dry weather prevails or drought threatens, shallow cultivation could be profitably continued several weeks longer.

The fertilizer in common use is a complete one, analyzing about 10 per cent phosphoric acid, 2 per cent nitrogen, and 2 per cent potash. This is in general accord with the practice throughout the cotton-growing States of using a fertilizer comparatively high in phosphorus.

In the last few years many farmers have applied a light dressing of nitrate of soda to their cotton about the time of the last plowing. The results are very apparent and generally a satisfactory increase in the growth is produced. The lack of humus in all the old cotton lands renders this easily available supply of nitrates especially acceptable to the plants. Almost as marked effects are to be observed in the use of barnyard manure.

The large-boll varieties are preferred by most farmers, and new importations of seed, chiefly from Georgia, are made every few years. No question is ever raised regarding the kind of soil on which these varieties were originated. The wide difference between the Greenville, Norfolk, and Ruston soils seems to render the selection of varieties known to be well adapted to similar soils elsewhere a matter worthy of consideration.

Cotton wilt, or black root, is very prevalent on all the light soils, but of less frequent occurrence on the heavy sandy loams. Since the

organism causing this trouble remains for several years in the soil after its presence becomes noticeable, fields so affected should be used for other crops for one or two years. No cowpeas except the "Iron" variety should be grown on land where the wilt is troublesome. This disease is also very injurious to cotton following sweet potatoes on infected soil.

On soils rich in humus the cotton usually escapes with but slight injury. Many instances were observed where the cotton on some exceptionally rich spot of ground showed but little signs of wilt, while on poor land near by the stand was thin and the plants small. Rotation of crops, however, is the most effective means of clearing land of this disease.

For the commercial years 1908–9 and 1909–10, the production of cotton in Pike County was about 32,000 and 28,000 bales, respectively. The crop for 1903 was 27,076 bales and for 1904, 42,400 bales.

In the last five years there has been a marked increase in the acreage of corn. Better cultural methods are also being generally practiced, as well as heavier fertilization. Many farmers are using nitrate of soda very liberally with this crop, applying from 75 to 200 pounds per acre. Besides the increased attention to the fields many farmers have on 1 or 2 acres followed a modification of the Williamson method. On these plots and those cultivated under the direction of the cooperative demonstration agents yields of 50 to 75 bushels per acre are very common.

For both cotton and corn early planting is recommended. Cowpeas or peanuts are very generally planted between the rows of corn. A portion of the crops is gathered, but they are largely utilized by turning in hogs or cows late in the season. The Spanish peanut is profitable as a field crop, yielding from 40 to 50 bushels of marketable nuts in good seasons. They do well on the sands and sandy loams of the Orangeburg and Norfolk series. To avoid possibility of injury by dry weather they should be planted by the middle of April and very frequent cultivation given. The crop can be largely handled by machinery, so that the cost per acre for fieldwork is low—estimated at about $15. The vines yield about 1 ton of hay per acre.

Fall-sown oats do well on practically all soils, but best on the sandy loams. The acreage is rather limited and the production never equals the local demand. Forage for mules consists chiefly of hand-pulled fodder, although crab grass and some cowpea hay are also used.

Much interest in the possibilities of alfalfa growing is taken by farmers who wish to keep more stock. The Greenville and Orangeburg soils are too high in iron to be suitable for this crop. The Susquehanna soils have the best adaptation. Phases where lime is in

evidence and where a natural growth of sweet clover is found should be chosen.

Truck growing receives slight attention and the local markets are not well supplied, except with watermelons and sweet potatoes.

Peaches do well on all the uplands, but the best phases of the Norfolk and Orangeburg sands and the sandy loams, as well as most of the Ruston soils, seem best adapted to the fruit. Until the last 15 or 20 years apple trees were commonly found on all the old homesteads. Now thrifty trees are rarely seen. The decline seems to be due to increase of parasitic enemies and failure to spray and care for the trees. Pears and grapes grow well, but as a rule receive comparatively little attention. Pear blight is ruining most of the old orchards.

Considering the number of farms and the acreage cultivated, the number of head of live stock is small. According to the assessors' returns for 1910, there were 4,382 cattle, or about 1 animal for each 100 acres of land. On most farms operated by owners a number of cows are kept, but on the large unfenced estates the tenants have very few. According to the same authority, there are some 12,000 hogs, a number far below the total requirement for pork products, much of the latter being obtained from outside sources. Very few sheep and goats are raised. Practically all of the 3,000 or more mules used on the farms and 700 head of horses owned in the county were imported.

A large proportion of the cattle and hogs are exempt from taxation. The opportunity to raise this stock in a very profitable manner is excellent. It is estimated that by use of peanuts, peas, and early grain crops hogs can be raised at a cost of about 3 cents a pound. Of course this does not include expense of fencing and buildings.

Most excellent permanent pastures can be had by use of Bermuda grass, Japan clover, and on some lands carpet grass and Johnson grass. The value of these grasses for this purpose has not been appreciated.

The majority of small landowners are not live-stock keepers by habit or inclination. The old idea that cattle and hogs could be raised profitably only in the open range still obtains to a considerable extent. A number of farmers in various sections of the county, however, are raising more live stock than formerly. The high prices that meat, dairy products, and poultry command is stimulating this industry.

Since the supplies of animal manure are so limited compared with the acreage cultivated, commercial fertilizers are almost exclusively used to maintain the productiveness of the soils. In most cases the improvement due to use of cowpeas, velvet beans or other crops is restricted to a relatively small acreage. The amount of vegetable matter thus returned to the land is far too meager. The total nitro-

gen enrichment by rows of cowpeas or peanuts planted 6 or 7 feet apart is not very great, especially when the tops are removed, as is generally the case. While the practice is beneficial, a better method is to sow broadcast once in several years at least. The best results, so far as improving the land is concerned, are obtained by plowing under the whole crop about the time the seed is forming. If pastured, and the stock remain continually on the land, there is little loss of fertility, but when the crop is removed there is invariably great loss of its fertilizing properties before the manure is returned to the land.

On the Greenville soils and on the heaviest phases of the Orangeburg sandy and fine sandy loams very light applications of manure plowed under insure a remarkable gain in fertility, the effects lasting for a number of years. There is not the rapid loss of organic matter in these types that occurs in lighter soils under similar conditions. They also maintain a good physical condition, with but little humus present. In all the lighter types, however, comparatively large amounts of vegetable matter are needed to give them that loamy or "spongy" structure so desirable in any soil and of first importance in securing good tilth and an equable moisture content. Several tons per acre of vegetable material, preferably some kind of legumes, is not too much to get into a soil designed for corn or cotton. Of course such management should be given as will insure its decomposition before the succeeding crop is planted.

In a soil so stocked with humus there is little need of nitrogenous fertilizers, while the mineral elements, either those occurring naturally in the soil or those that may be applied, become available to a greater degree than where vegetable matter is absent. Lime also may be safely used on land rich in humus, where the presence of this mineral is desired to correct acidity or encourage the growth of clover or alfalfa.

These fundamental principles in soil fertility, while known to most farmers, are very generally ignored in actual practice. The comparatively simple and easy method of applying ready-mixed fertilizers has quite naturally led to their very extensive use. It also tends to confirm the opinion that crop yields can be indefinitely maintained by the use of commercial fertilizers alone. The great importance of the physical condition of the soil has been generally overlooked in the attempt to supply its supposed chemical deficiencies. The heavier soils are difficult to keep in good tilth, chiefly on account of lack of vegetable matter. The sands and lightest phases of the sandy loams, while more easily cultivated, are equally in need of humus to improve their capacity, to retain moisture, and to lessen in some degree the frequent changes from saturation to extreme dryness that occur in seasons when the weather conditions are abnormal.

The following three-year crop rotation could be adopted on most of the smaller farms, which are operated by the owners: First year, fall-sown oats or rye, with vetch or crimson clover; second year, cowpeas, or cowpeas and sorghum or velvet beans; third year, corn or cotton.

A cover crop, as fall-sown oats, rye, or even weeds, is beneficial in conserving fertility. Besides reducing surface wash, a portion of the nitrate is appropriated by it and held within reach of succeeding crops instead of being permanently lost by the leaching of winter rains.

On the large estates there are practical difficulties in the way of adopting any rotation or making a change from the present one-crop method of management. The negro tenants are generally averse to cultivating any crop except cotton, and they are not very successful outside of this line unless very closely superintended. It is also impossible profitably to utilize large amounts of forage where so little stock is kept, so that on the numerous large holdings common in the best section of the county the culture of cotton and the dependence upon commercial fertilizers is in large measure unavoidable.

At present there is a strong demand for responsible white tenants to assume the management of these estates. Unfortunately, many of the white tenants now in the county do not care to abandon methods to which they have been accustomed all their lives, and therefore crop rotations and stock growing do not greatly interest them.

The rent paid for land ranges from 1 bale to 3 bales of cotton "per plow," the latter being a rather indefinite term, but usually meaning from 25 to 30 acres of tilled land. "Standing rent," or a stipulated amount of lint cotton, is often paid by white tenants for improved farms. In nearly all cases the use of house, garden, fuel, and land for corn is given without further consideration.

Farm labor receives from $12 to $15 per month with a stipulated amount of supplies. Day labor commands upward of $1 a day. The wages paid women for hoeing range from 50 cents per day upward. Cotton pickers receive from 40 to 60 cents per hundred pounds. In recent years labor has been abundant, but it is not skilled and in most cases requires constant supervision.

According to the assessors' returns for 1910, the value of farm lands and improvements thereon is $1,933,545. This represents about half the actual value. The average price of land throughout the county may be placed at about $12 an acre. Since there are no minerals and the area of timber land, except that along the rivers, is insignificant, these values are based chiefly upon present estimated agricultural worth. In recent years there has been a

marked increase in the price asked for farms. This has been greatest in the case of those desirably situated and consisting largely of land well adapted to general farming. The light sands and those types better adapted to some special truck crops are not at present in demand to the same extent as heavier types.

The rising price of land and the rapidly increasing cost of producing all crops will tend to make still greater differences between values of the best types and those less desirable for cultivation. It would be of decided advantage if much of the latter were devoted to pasture or timber growing and more of the fertile bottom lands were reclaimed.

SOILS.

With the exception of the alluvium along the larger streams and a somewhat limited development of strictly residual soils from limestone and beds of sedimentary clay, the soils of this county are derived from the mantle of reddish sands, or sandy clays, that almost everywhere comprises the superficial formation. This material as a whole resembles the Lafayette deposits of the Coastal Plain, but there are indications that suggest a local origin of the material. In all sections of the area places may be found where the red surface material apparently represents simply the depth to which oxidation and solution has affected the original deposits. In other instances the general structure indicates more or less reworking of the original materials either by aqueous or subaerial agencies.

In comparing the surface materials in one section of the county with those in another quite marked differences in character may be observed. In the northern part the underlying strata are of Cretaceous age; in the southern half the sedimentary formations belong to the Tertiary period. In each of these geological divisions there are several formations that have contributed materials to the present unconsolidated surface deposits. The nature of the latter frequently depends in a measure upon the character of the underlying strata.

But material of any kind, or from any source, subjected to weathering tends toward a certain degree of uniformity. Thus a clay, whether from the Cretaceous or Tertiary limestone, or of the light-colored sedimentary clay so frequently exposed in all parts of the county, assumes a red color on long exposure. This is caused by the oxidation of the iron content. The depth to which this tint prevails is determined chiefly by the permeability of the material, although surface drainage, vegetal covering, and other conditions are factors of importance. The clay soils on steep hillsides may be red or reddish brown only to a depth of a foot or so, because the loosened surface particles are removed by erosion at a rate nearly as fast as weathering proceeds downward.

In general the deep-red color prevails wherever the material is of such structure that both air and moisture have comparatively easy

circulation to considerable depths, but is not so porous as to admit of the "leaching" that takes place in a sand. The best examples of almost perfect conditions in this respect are seen in the brick-red sandy clay that is the basis of all the Orangeburg and Greenville types. Where the material below the loose surface sand is more retentive of moisture, or the underdrainage is less effective than in the case of the subsoil just mentioned, yellowish tints usually prevail. In many instances the brilliant mottling of the lower subsoil indicates irregular moisture content due either to peculiarities of structure or imperviousness of the substratum. The higher the average water content, usually the more pronounced the gray tints. In the soils almost constantly saturated, as some of the Ocklocknee types, the lower subsoil is generally very light colored. Thus the coloration is a fairly reliable index of the average condition with regard to aeration and drainage.

With a few exceptions the surface of all the types in this area is a more or less weathered quartzic sand. In the lighter types it represents the soil particles most resistant to solution and the least easily removed by erosion. The depth of this sand in any given area is largely a function of topography, but, of course, depends also upon the composition of the basal material.

Owing to the high relief of most of this region, the soil-forming processes just mentioned have been and are now comparatively vigorous. The changes observed in the depth of the surface soil and the color and general character of the subsoil are very frequent even within limited areas. These physical differences are expressed in the class names as coarse sands, fine sands, sandy loams, clays, etc., to which is prefixed a proper name indicating to what one of several large groups the particular soil type belongs. Thus Orangeburg sand is a red sand of agricultural value quite different from that of the Norfolk sand, which, as it occurs in Pike County, is a poor soil.

In a previous classification (see Alabama Geological Survey 1881–82) of the soils of the State this county was included in the "Oak and hickory uplands with longleaf pine." This term was particularly applicable to the areas of Greenville, Orangeburg, and Susquehanna soils on account of the mixed character of the original forest. The Norfolk types, however, afforded the principal exception, since the dominant species was pine with several varieties of scrubby oak as a second growth.

In this county the major soil groups occur in fairly well-defined belts extending east and west. They follow, roughly, the strike of the Cretaceous outcrops in the northern half of the area, but do not conform quite so well to the Tertiary in the south.

The surface formation in the upper half of the extreme northern township is a very coarse red sandy clay, many feet in depth. It

yields rather easily to weathering and the surface is a grayish sand corresponding fairly well with the coarsest type of the Norfolk series.

Below China Grove the average depth of the loose sand decreases as it passes into limited areas of sandy loam. A little farther south the latter merges into a comparatively wide belt of heavy red soils, derived chiefly from exposures of the Ripley formation. The latter consists largely of clays, marls, and very impure limestones. The resultant soils, a clay and a heavy fine sandy loam, are calcareous in places, but not uniformly so, for the surface has suffered too much leaching and the parent material is often heavy clay with little lime. These types are dominant in the lower half of the north township and in the extreme northeast and northwest corners of the county. They are similar to the Susquehanna soils of Montgomery County, although in the survey of the latter the sandy phases were not separately indicated.

Below the Susquehanna soils there is a belt of hilly to broken uplands whose southern limits roughly coincide with a line drawn through the middle of the tenth tier of townships. The general character of the surface material is quite similar throughout this region, except in the valleys of the streams crossing it. The soils are generally sandy and carry more or less iron concretions in various forms. The parent material consists chiefly of light-red, reddish-brown, or gray and brown mottled micaceous sand and clay in which irregular stratification and cross bedding are usually observable. Flakes and streaks of a light-colored, unctuous clay occur in the sand, and at various horizons this argillaceous material thickens into heavy impervious beds. At the contact between the strata of different degrees of permeability iron crusts often occur, and the fragments of such conglomerates as well as small concretions are very abundant in many places. The individual soil particles, however, are not so well coated with iron oxide as those of the Orangeburg soils and consequently lighter tints prevailed in the roadside ditches than in the similar exposures in the "red lands." The general appearance of most of the material is not suggestive of a high degree of fertility. There is too much quartz sand, mica, and impalpable clay.

The highest elevations in this region are conical hills or narrow ridges, the surface of which is usually covered with ferruginous stone and gravel. These areas are indicated upon the map as Susquehanna stony sandy loam. The lower slopes of these elevations and the intervening ridges of more moderate relief are usually sandy. The deeper phases are correlated with the Norfolk sand. Those areas over which the surface sand is but a foot or so in depth, with a subsoil consisting of the material described above in some detail, have been mapped as Ruston sandy loam.

Where the topography is somewhat gentler, as on the slopes overlooking the Conecuh Valley, the Ruston soil passes into a type having a yellowish clayey subsoil with a more uniform surface soil. This phase of the material has been correlated with the Norfolk sandy loam, a type of comparatively high agricultural value.

On the steep hillsides throughout this section of the county the exposure of the clay beds gives rise to small isolated areas of soil having very heavy subsoils.

In the southern half of the county the surface materials, except in the valleys, consist chiefly of red sands or red sandy clay. In the vicinity of Troy and south of Little Oak, as well as east of these points, the Orangeburg soil predominates. In the neighborhood of Brundidge and Pronto the Greenville types occur. Associated with each of these series are more or less extensive developments of the light-colored Norfolk soils.

The red material of the Orangeburg type does not usually exceed a few yards in depth; often it is only a few feet to material of different character and of less desirable properties from the standpoint of soil fertility. Frequently it is underlain by a nearly impervious clay, and in some instances, at least, rests upon limestone, but the latter as a rule is very deeply buried.

The material giving rise to the Greenville soils usually extends with but little change in composition to greater depths. In some places this heavy dark-red sandy clay, the compactness of which is further increased by the high content of iron oxide, rests directly upon limestone. Its relationship to this rock has been suggested (Alabama Geological Survey, 1881–82) as probably contributing to its fertility; but in other places the heavy red surface stratum grades downward to a loose white sand, there being little difference between the soils in the respective localities.

In the southwestern part of the area the Susquehanna soils are derived apparently from the clays and, to a less extent, from the associated impure limestone that outcrop near Henderson and at numerous other places. This residual clay contains a good deal of fine sand, and the soils are mostly fine sandy loams.

The Orangeburg fine sandy loam seems to represent certain phases of this material from the limestone, which has been mixed to a considerable extent with sand evidently from the more arenaceous deposits to the north of it.

The several classes of Norfolk sand represent those places in the parent material where solution, erosion, both surface and interstitial, and to some extent local transportation and redeposition, have been most vigorous. There has been greater loss of the more soluble elements with consequent increase in the proportion of the insoluble ones. These changes, or rather the rate at which they have been

operative, have depended largely upon the character of the material originally, but are almost independent of geological age. Thus the accumulations of siliceous sand 3 feet or more in depth are found in all sections of the area.

In most instances the sand is comparatively shallow and grades into compact sandy clay of reddish color. In only a few instances are deep, loose sands found. Between Troy and Banks deposits of this kind occur; but the individual areas, as compared with the shallow sands, are small and the popular estimates of their depth usually exaggerated.

The light types of the Conecuh and Pea River terraces are more closely related to the Norfolk series than to the soils usually found on the second and third bottoms of the larger rivers of the State. The latter have gathered their sediments from wide and varied sources compared with the limited areas tributary to the above-named streams. It is evident that these terraces are largely composed of materials derived from the adjacent uplands, for they are built up of rather coarser sediments than are now being deposited on the overflow lands. It is probable that the latter are richer in the minerals that contribute to a fertile soil than were the original deposits at higher levels.

In general, the surface soils, with exceptions previously noted, are deficient in lime, a condition due to the heavy rainfall and comparatively high average temperature. The same factors account for the meager amount of humus in the virgin upland soils and the difficulty of maintaining an adequate supply of this indispensable constituent in cultivated lands.

The actual and relative extent of the various soil types found in the county are shown in the following table:

Areas of different soils.

Soils.	Acres.	Per cent.	Soils.	Acres.	Per cent.
Norfolk sand	57,536	15.6	Orangeburg fine sand	7,808	1.8
Heavy substratum phase	9,856		Susquehanna sandy loam	7,104	1.6
Meadow	59,008	13.7	Kalmia fine sand	5,632	1.3
Orangeburg sandy loam	47,808	11.1	Norfolk fine sand	4,928	1.0
Ruston sandy loam	40,000	9.3	Greenville coarse sandy loam	3,712	.9
Susquehanna fine sandy loam	30,208	7.0	Norfolk fine sandy loam	2,688	.6
Orangeburg sand	30,080	7.0	Cahaba sandy loam	2,560	.6
Norfolk coarse sand	27,008	6.3	Ocklocknee loam	2,240	.5
Orangeburg fine sandy loam	17,856	4.1	Greenville coarse sand	1,408	.3
Susquehanna clay	15,296	3.5	Norfolk coarse sandy loam	768	.2
Greenville sandy loam	12,032	2.8	Kalmia sand	512	.1
Orangeburg coarse sand	10,816	2.5	Bibb sandy loam	384	.1
Norfolk sandy loam	10,048	2.3	Ocklocknee fine sandy loam	320	.1
Susquehanna stony sandy loam	8,384	1.9	Henderson stony clay	192	.1
Cahaba sand	8,000	1.9	Total	432,000	
Kalmia fine sandy loam	7,808	1.8			

GREENVILLE COARSE SAND.

The surface soil of the Greenville coarse sand is a brown or very dark reddish-brown medium to coarse sand. Nearly all the grains are coated with ferric hydroxide, so that the color is uniformly darker than that of the Orangeburg sand. If dry the material is very much lighter colored than when wet, the difference being decidedly noticeable. There is a considerable proportion of medium and fine grades of sand in most of this type, so that it is hardly so open in structure as the Norfolk coarse sand. The small amount of clay present and what is evidently free particles of iron oxide give a slight coherency to the sand if it is damp, and also impart a rather dingy appearance to the surface when dry. The humus content is usually low, but it is possible that the dark color may be due in some measure to organic matter.

The subsoil is usually similar to the soil in texture. In many instances it contains a little higher percentage of fine particles, which causes the sand grains to cohere feebly in small crumbs when the material is moist. The color is usually a reddish brown, brighter than that of the surface soil. In those places where pieces of heavy, dark-colored iron ore occur there may be no difference in the color or texture of the sand to a depth of several feet.

The deepest phases of this sand are found at the heads of branches in or near areas of the heavier Greenville soils. In such places the surface material is derived mainly from the higher ground adjacent, but why in the process of transportation by surface wash and creeks the grains should not have lost more of their coating of oxide is not easily explained.

The areas of Greenville coarse sand near Walnut Creek are not so clearly differentiated from the Orangeburg sands. The surface is quite dark, but the subsoil in many instances is a reddish sand grading to sandy clay with increase of depth.

The Greenville coarse sand is of limited extent, occurring generally on the lower slopes of those divides over which the Greenville sandy loam predominates.

The agricultural value is comparatively high for a coarse sand of such depth. This is due in large measure to the favorable moisture content, for this sand has better capillarity than the less ferruginous material of similar texture. While much of it is too light to be well adapted to general farm crops, cotton does well in normal seasons. Excellent watermelons, sweet potatoes, and other truck crops are grown. Oats should do fairly well.

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

Mechanical analyses of Greenville coarse 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.*
24029	Soil	0.4	39.1	35.8	8.4	2.8	6.2	6.9
24030	Subsoil	.1	33.0	38.1	9.8	2.0	6.7	10.0

GREENVILLE COARSE SANDY LOAM.

The soil of the Greenville coarse sandy loam varies from a coarse loamy sand to a heavy sandy loam of much finer texture. While the immediate surface is usually a coarse sand at a depth of a few inches fine material constitutes a large proportion of the soil. Even in the heaviest phases the angular sand grains impart a coarse gritty feel to a hand sample, and give the material a "grainy" structure. It will, however, become very compact under pressure if wet, for the cementing effect of the clay particles is evidently increased by the high content of iron oxide. Under usual field conditions the soil is friable and clods formed where the subsoil has been turned up tend soon to break down into a crumbly mass. A very little humus greatly increases the friability and ease of tillage. The surface color of old fields is much darker than that of the Orangeburg sandy loam. It is usually dull reddish brown, while the fresh earth is a pronounced reddish brown.

The subsoil is a dark reddish brown to dark red sandy clay, usually not quite so coarse in texture as the soil. It is a rather stiff, firm material, the sides of artificial excavations presenting a hard, "grainy" surface that resists atmospheric weathering almost indefinitely.

On the broad divides east of Pronto this hard red sandy clay extends with but slight change in color or texture to a depth of at least 20 feet. In other localities it may be less and in some places it changes gradually to a light-colored sand. The subsoil of the small areas of the type near Buck Horn and Richland Creeks is underlain by light grayish clay. In such instance the type is usually not very different from the Orangeburg sandy loam.

In all cases the subsoil has a remarkable capacity for absorbing and holding the rainfall, and it is usually of sufficient depth to afford a practically inexhaustible supply of reserve moisture.

The topography varies from the undulating or very gently rolling crests of the main divides to the comparatively steep slopes of minor ridges near the streams. The areas in the latter situations are generally small, the characteristics of the Greenville soils becoming less pronounced and the type merging into the Orangeburg soils.

Characteristic features of the Greenville topography are occasional mound-shaped hills rising 20 to 30 feet above the general eleva-

tion of the neighboring ridges. The tops of these elevations are usually strewn with dark reddish brown iron ore, much harder and denser than the ferruginous concretions occurring in other places on this and related types. This rock is so abundant on some of the hills as to interfere somewhat with cultivation. As a rule the subsoil does not contain many large pieces, but small concretions are found at all depths. The fine earth is also ferruginous, for if a wet sample of this subsoil is handled it stains the fingers red.

The surface drainage is excellent, and the structure of the material to a depth of many feet is highly favorable to the maintenance of a good moisture content. It is sufficiently porous to admit of effective internal drainage and aeration, but not so open that the capillarity is feeble. The subsoil does not remain saturated very long after a heavy rain, nor is it often found deficient in moisture in dry periods, except where the surface soil is compacted. Farmers frequently state that these red lands dry out badly in short periods of drought, but in many instances in the course of this survey this condition was found to be due to shallow plowing and improper tillage. The capillary movement of the soil water is so rapid that where the surface is hard evaporation therefrom soon exhausts the moisture to a considerable depth; where the ground has been well plowed and a layer of loose earth maintained by shallow cultivation crops are seldom injured.

These physical properties account in large measure for the high agricultural value of the type. The limestone that occurs at 20 to 30 feet below the surface in some of the upland areas may also indirectly influence the fertility of the soil.

Most of this type has been in cultivation 50 years or more and still produces good crops of cotton, with but moderate fertilization. Without rotation and under the careless management of negro tenants the yield is from one-half to more than 1 bale per acre. Wherever better cultivation is practiced and the lack of organic matter is supplied by manure or liberal applications of cottonseed meal the average returns are about 1 bale per acre. This soil responds exceptionally well to barnyard manure, and all crops are greatly benefited, the effects of even slight applications being observable for many years.

The usual fertilization for cotton is from 100 to 200 pounds of 10–2–2 fertilizer. On some of the smaller farms crop rotation and heavier fertilization are practiced.

Corn, winter oats, cowpeas, and sorghum do well, especially where the nitrogen requirements are met by increasing the humus in the soil. As previously stated, the deficiency of vegetable matter, due to long cultivation, is the limiting element in soil productivity. If this were liberally increased comparatively light applications of min-

eral fertilizer would be necessary to secure better yields than the present average returns.

This type and the closely related Greenville sandy loam are highly desirable for general farming. Should stock raising ever become as important a part of agriculture as conditions in this county warrant it should, these heavy soils will be found especially suitable for such diversified crops as will then be necessary. Practically all the native grasses, as well as all cultivated crops, may be grown. Alfalfa would not do well on account of the high content of iron. Lime would doubtless be beneficial, but has never been used for any crop.

The original forest of shortleaf pine, with more or less hickory and oak, is now represented by a few groves of white and post oak near dwellings and churches.

The value of well-improved farms desirably located is about $50 per acre. Poorly improved lands at some distance from the towns are worth from $20 to $40. But little of this land is offered for sale, although in recent years it has increased in price more than other types. Much of this land commands 3 bales of cotton as annual rent for about 25 acres.

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 Greenville coarse 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.*
24027	Soil	0.9	23.8	21.1	24.9	6.6	11.7	11.1
24026, 24028	Subsoil	2.5	16.6	15.2	13.5	4.7	12.7	34.7

GREENVILLE SANDY LOAM.

This type resembles the Greenville coarse sandy loam in color, mineralogical composition, and general agricultural adaptations. The chief difference between the two is in the somewhat finer texture of the sandy loam, the surface varying from a medium sand to a rather heavy sandy loam.

The subsoil is practically identical with that of the coarse sandy loam, a red or dark reddish brown sandy clay extending to a considerable depth with but slight change in character. There are usually some small hard concretions scattered through it and occasionally thin layers of ironstone and pieces of iron ore, but such material is not usually abundant and seldom accumulates in noticeable quantities upon the surface.

The largest areas are found on the broad divides near Banks and Pronto. The surface is moderately rolling, with limited areas—

usually less than 100 acres—that are nearly level. In a few places there are shallow depressions where the soil is a dark loam, containing much more silt and clay and also organic matter than the higher ground. These heavier soils require artificial drainage.

The physical properties of this subsoil insure excellent internal drainage and aeration. The heavier phases require a little deeper plowing and more cultivation to reduce the soil to a good state of tilth than is necessary on the lighter soils of the red lands. On the hillsides, where the surface is generally a loamy sand to a depth of several inches, terraces are thrown up, but on most of the type they are hardly needed. Many of these old fields have been in cultivation for years and are free from obstructions of all kinds.

The average yield of cotton is about 1 bale per acre, but where good tillage and rather liberal fertilization are given 2 bales per acre are sometimes secured. The acreage of corn and other crops is small, though the soil is well adapted to general farming and under proper management many crops besides cotton could be made highly productive.

The price of land composed of this type of soil ranges from $25 to $50 an acre, according to location and character of improvements.

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

Mechanical analyses of Greenville 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.*
24021, 24023.....	Soil.....	0.6	7.4	11.9	44.4	10.9	11.8	12.5
24022, 24024.....	Subsoil.....	.7	6.2	8.4	27.0	8.0	11.3	38.0

ORANGEBURG COARSE SAND.

This type resembles the Orangeburg sand except in texture. The soil contains a higher percentage of coarse angular grains and the subsoil is usually coarser and not quite so compact. The soil is a gray to a light-brown loose coarse sand, about 15 to 30 inches deep. The substratum is a red sandy clay not essentially different from that underlying most of the Orangeburg sand or sandy loam.

The areas north and northeast of Troy cover some rather hilly uplands and the depth of the sand is rather variable. Toward the east the type generally becomes deeper and lighter colored and finally merges into the larger areas of Norfolk coarse sand.

The narrow areas along the Three Notch Road and the roads branching from it are generally the crests of ridges where the depth to consolidated red sandy clay is but 3 or 4 feet, and the overlying material

is a red sand with varying percentages of coarse grains, but usually enough to render the soil comparatively open and loose.

The areas adjacent to the branches and small creeks are generally the accumulations of sand wash from the hillsides above, which average rather high in the percentage of coarse grains. In some places the soil is rather light colored and droughty, but much of the type is fairly productive.

In general the coarse sand is a little less desirable for agricultural purposes than the Orangeburg sand. The coarse texture does not admit of quite so good a capillary movement of water from the subsoil or the underlying red sandy clay, as in case of the sands of firmer texture. This is modified to a considerable extent by local variation in the amount of finer material in the soil and the depth to and character of the basal material.

Average results of mechanical analyses of the soil and subsoil, taken from the upland ridges, are given in the following table:

Mechanical analyses of Orangeburg coarse 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.*
24066, 24068.....	Soil.....	4.2	33.0	32.5	15.6	3.6	6.1	4.4
24067, 24069.....	Subsoil.....	4.3	27.9	29.2	16.5	3.7	7.6	11.8

ORANGEBURG SAND.

This type is of common occurrence in those localities where the Orangeburg and Greenville sandy loams are found. In many instances it is a derivative of the former type, representing the deeper accumulation of red sands due to surface erosion in local depressions and along the lower slopes of divides. In many places it is found upon comparatively high ground and evidently owes its origin to a more complete removal to a depth of several feet of the original content of fine material than has occurred in the normal phases of the sandy loam.

On the lower slopes of the hills the type usually consists of several inches of brownish-gray or reddish-brown medium sand with but little fine material. It is generally quite loose and unless there is more than the usual amount of vegetable matter present is not very loamy.

The subsoil consists chiefly of medium sand with enough interstitial material, especially in the lower part, to be somewhat coherent. It frequently grades to light sandy loam while at a depth of a few feet sandy clay is found.

The color of the subsoil varies from a light brown or brownish red in the lightest and least coherent sand to a brick red, the latter being

characteristic of the lower subsoil, where it is a clayey sand resembling the subsoil of the Orangeburg sandy loam.

On the higher divides the type is of less frequent occurrence. In such locations the soil is usually a brown sand containing a little more of the finer grades of material than is common to the slope phases. At a depth of 10 to 15 inches it grades to red sand of brighter color, which with increase of depth becomes a compact sandy clay, the basic material of all the coarser Orangeburg soils.

The sand consists chiefly of quartz. The red color is due to a coating of iron oxide which seems to be very persistent upon all except the coarsest grains at the surface. The latter are pink, light brown, or nearly white. Minute particles of iron oxide, doubtless from some of the fine material of the subsoil, increase the coherency and impart to some extent the capacity to hold moisture.

Iron concretions are usually present but not abundant. On the slight local elevations and some of the sharper slopes of the hillsides they may be very numerous at the surface, but in such places the soil is really a sandy loam, the spots being generally too small to separate in the map.

Like most sandy soils this type as a whole has a rather low degree of fertility, though it is superior in this respect to the Norfolk sand, enduring continuous cropping better and responding somewhat more readily to fertilization. Some land that has been in cultivation many years still produces fair crops of cotton, while oats and the minor forage crops do well in normal seasons.

The moderately dark red or brown sand with a sticky red sand subsoil that grades to a compact sandy clay at less than 4 or 5 feet is the most desirable phase.[1] It is a suitable soil for early crops and for winter rye and oats. Some excellent crops of sweet potatoes and peanuts have been grown on this phase. Crops endure extremely dry periods better than on the lighter phases of either this or the Norfolk sand.

With a liberal increase in organic matter much of this type is admirably adapted to truck crops, and but little inferior to the lightest phases of the Orangeburg sandy loam for general farming.

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

Mechanical analyses of Orangeburg 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.*
24058, 24060.....	Soil.....	1.0	10.3	14.8	56.2	4.9	9.5	3.1
24059, 24061.....	Subsoil.....	.6	7.6	12.8	54.9	6.1	9.6	8.0

[1] This is really Greenville sand and would have been separated from the grayish to brown typical Orangeburg sand except for the small extent of such areas.

ORANGEBURG FINE SAND.

This type is a fine sand 2 feet or more in depth resembling the Norfolk fine sand of this area in origin and general mineralogical composition. There is a little higher percentage of silt and clay and with the exception of the immediate surface layer, the material is less bleached than the Norfolk sand, the soil particles retaining more of the red coating of iron oxide.

The depth and the degree to which weathering has affected the sand vary a good deal even in the same field. In some instances the surface of cultivated land is a light-colored fine sand, somewhat bleached and "lifeless" in appearance and inclined to pack rather firmly unless frequently stirred. A few inches below the surface the sand is gray, acquiring a reddish hue with increase of depth and at 15 to 20 inches grading into a red fine sandy clay or loam. On local elevations the soil may be a shallow reddish fine sand with a rather compact sandy loam subsoil, while in the depressions the sand is much deeper and lighter colored.

In general the topography varies from undulating in areas of a hundred or more acres in extent to moderately hilly in larger tracts near streams. In some cases it extends well back upon the central divides. In the latter case the surface is often irregular, including depressions suggestive of lime sinks and small rounded hills rising above the general level. Most of the surface is tillable, there being little waste land.

The heaviest phases of this sand are almost identical in agricultural value with the Orangeburg fine sandy loam. The deeper sand is generally underlain by red sandy clay at less than 4 or 5 feet, which, with the fine texture of the sand, insures good capillarity. Where the surface is a reddish fine sand the subsoil is invariably found to have a good water content. But so much of the type is deficient in humus that the soil of the finest phases is inclined to pack after rains, while the deeper sand suffers considerable leaching with consequent loss of fertilizer.

In general crops on this fine sand are more susceptible to extremes of rainfall and drought than corresponding areas on the red sandy loams, but this can be largely modified by proper tillage. On one upland field of a rather light phase the cotton endured the unfavorable season of 1910 very well. The ground here had been deeply plowed and well cultivated.

The type is of limited extent in this county. It is closely associated with the Orangeburg fine sandy loam. Farmers recognize in the fine sand a much lighter soil, but it is valued at about the same price and rental value per acre. With liberal fertilization the yields of cotton and corn are about the same on the fine sand as

on the fine sandy loam, but the latter is a more durable soil, especially in its heavier phases. For cane, watermelons, sweet potatoes, and truck the former is to be preferred, but practically none of it is so used at present.

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

Mechanical analyses of Orangeburg fine 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.*
24062	Soil	1.0	4.0	7.3	57.3	19.1	5.8	4.9
24063	Subsoil	.5	2.4	5.5	47.8	20.6	12.4	10.7

ORANGEBURG SANDY LOAM.

The soil of the Orangeburg sandy loam, to an average depth of about 9 inches, is a brownish-gray to reddish-brown sand. The medium and coarser grades form a considerable proportion of the whole, so that the surface of cultivated fields usually has a rather coarse, loose texture. At a depth of a few inches there is more of the finer grades of soil particles, and this part is generally coherent, in many instances being a light sandy loam.

The subsoil is a sandy loam, changing at 18 or 20 inches to a brick-red sandy clay. As a rule it extends to a depth of several feet without much change in color or structure. It is usuallly deepest and most uniform in color on the gentler slopes and tops of the wider divides. On steep hillsides the sandy surface soil is more variable in depth and the subsoil presents frequent change in color and structure. In such localities there is generally more or less ferruginous material, consisting chiefly of small red and brown pebbles. Iron ore and conglomerate rock occur in some of the rougher places, usually narrow ridges or local elevations of limited extent, where the soil is very thin and the subsoil in part is a mottled red and gray jointed clay, streaked with brown ferruginous layers of various degrees of hardness.

The areas of Orangeburg sandy loam are of common occurrence through the central part of the county. They are usually found on the higher parts of the interstream divides. On the lower flanks of these ridges the sandy surface soil usually becomes deeper and the type merges into a sand. In some of the larger areas the type prevails from the highest elevations well down to the Meadow along the branches, or extends without essential change in character from one low ridge to another. Along the main roads there are occasional areas, a fraction of a mile or so in width, where the surface is undulating or very gently inclined toward the crest of the adjoining slope. Such land is admirably adapted to cultivation, but unfortu-

nately is of small extent. Most of the type is rolling to moderately hilly.

The areas in the eastern part of the county associated with the Greenville soils are darker colored and carry more gravel and iron stone than those near Troy. As a rule the soil is also of less depth and the subsoil more compact. Toward the southern limit of the Orangeburg sandy loam the texture of the soil is generally finer and heavy phases of the subsoil are more common. In the southwestern part of the county a considerable part of this type passes so gradually into the Susquehanna and Orangeburg fine sandy loams that no definite boundary can be drawn. The sandy loam is generally a little more variable in depth and more gravelly than either of the fine sandy loams.

Practically all of this type is cleared and now cultivated. Well-located farms, consisting chiefly of the Orangeburg type, have a valuation ranging from $25 to $50 an acre.

The average yield of cotton may be placed at somewhat more than 1 bale per acre. On some of the large estates, where negro tenants do most of the farming, the returns are likely to be less than this if the season be unfavorable. But the excellent physical structure of most of the type insures a good moisture content throughout the season if proper tillage be given. Crops somtimes suffer during dry periods, but this generally is due to shallow plowing and subsequent tillage with a single shovel plow, a method not calculated to conserve moisture.

The humus is so generally exhausted in this soil that in most cases complete fertilizers are needed for corn and cotton. From 200 to 400 pounds of a 10–2–2 grade is used for these crops. Nitrate of soda gives marked results, and of course there is little danger of loss through leaching.

The type in its surface features and physical structure is so well adapted to a wide range of forage crops, such as oats, sorghum, cowpeas, and velvet beans, as well as grass—especially on the heavier phases—that a rotation calculated to increase the humus content can be put into practice on most farms. The plowing under of a crop of cowpeas once in two or three years is to be strongly recommended where corn is to be grown. This, if deep early plowing is done, should insure against drought and obviate the necessity of using nitrogenous fertilizers. Some phosphorus and kainit could be used to advantage but the results would be better than usually accrue from the same amounts applied to ground devoid of humus, as is now generally the case.

Some of the high ridges where the soil is a moderately coarse sand to a depth of 12 to 15 inches with stiff subsoil are favorable locations for peach orchards.

The soil is too high in iron to be well adapted to alfalfa. Heavy applications of lime would be needed for any of the clovers, except Lespedeza. The heaviest phases, especially some of the hillsides where "gall spots" are numerous, could be easily seeded to Bermuda grass. Johnson grass thrives on this type, and in cornfields crab-grass and "Florida pusley" make a very rank growth in the fall.

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

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.*
24070, 24072.....	Soil.....	0.9	15.1	22.5	31.2	10.1	12.2	4.8
24071, 24073.....	Subsoil.....	.9	10.4	15.9	22.9	10.8	12.0	26.8

ORANGEBURG FINE SANDY LOAM.

The soil to a depth of about 8 inches is a moderately dark gray fine sand. It rarely has a bleached appearance, the surface generally being rather loamy. At a depth of a few inches the sand often assumes a light-red or light reddish brown tint.

The contact between the soil and subsoil is usually pretty well defined. The latter is a brick-red fine sandy clay. It is distinctly "grainy" in appearance, and at the usual moisture content is crumbly. It usually extends without much change in its physical character to a depth of several feet. The most frequent variation in the lower subsoil is toward a heavier and more clayey structure. This is often observable in the lower part of roadside ditches, where the uniformly red "grainy" surface sandy clay changes to a granular material, which, as it dries, tends to break down into roughly cubical fragments. When wet, the increased plasticity of the latter and also its adhesiveness, in the extremely heavy phases, are very much in evidence in the deeper road cuts and on the occasional "gall spots" occurring in the older fields.

This type is a common occurrence in the southwestern and south-central parts of the county. It is associated with Susquehanna fine sandy loam of that region and in nearly all cases the boundary between the two is more or less arbitrary. The dark-red sandy material of the Orangeburg type grades into the more clayey but somewhat lighter-colored Susquehanna soil.

Much of this type occurs on high rolling ridges, the central portion of which sometimes affords comparatively level areas of from 10 to 40 acres in extent. The slopes for the most part are rather easy and there is comparatively little land too rough to be farmed. Most of

the areas near Big Creek and those near Silers Mill Creek have moderate relief and afford some exceptionally fine areas of farm land. The rough areas, especially in those localities where limestone occasionally outcrops, usually merge into the Susquehanna fine sandy loam.

In a few instances the soil is a very dark red loamy sand a few inches deep with a heavy dark-red sandy clay subsoil. This represents Greenville material, but was included with the Orangeburg on account of the small extent.

Though most of this type has been in cultivation many years the present average yield of cotton is close to 1 bale per acre. Where the humus content is increased by turning under cowpeas or even weeds and grass and from 200 to 300 pounds of commercial fertilizer is applied the returns for cotton, in normal seasons, are even above this estimate. Under like conditions 20 to 25 bushels of corn is generally secured.

The type responds readily to fertilization. Considering the generally heavy nature of the subsoil it seems that lighter applications of potash should be necessary than on the more sandy type. There can be no question of its prompt response to manure or vegetable matter in any form. This is of first consideration, for so much of this type has been in cotton for such long periods, with few changes to other crops, that the humus content is depleted. It is inherently a strong soil, perhaps a little more so than the Orangeburg sandy loam, and resembles the Greenville types in this respect.

The present valuation of this land ranges from $20 to $40 an acre, the difference in price depending chiefly on difference in location. Some well improved farms near Brundidge, consisting largely of this type, are valued at about $50 an acre. It commands an annual rent of 2 to 3 bales "per plow" of 20 to 30 acres.

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

Mechanical analyses of Orangeburg fine sandy loam.

Number.	Description.	Fine gravel.	Coarse sand.	Medium sand.	Fine sand.	Very fine sand.	Silt.	Clay.
		Per cent.	*Per cent.*	*Per cent.*	*Per cent.*	*Per cent.*	*Per cent.*	*Per cent.*
24074	Soil	0.3	5.1	7.3	49.5	18.9	15.4	3.3
24075	Subsoil	.2	2.6	4.8	36.7	15.4	15.0	25.3

NORFOLK COARSE SAND.

There are two rather extensive areas of Norfolk coarse sand in the county. One occurs in the extreme northern part, while the other lies between Troy and Banks, this sand being the dominant type on either side of the Atlantic Coast Line Railroad for several miles.

The surface material of these respective areas is of different origin, geologically, but in each case consists chiefly of quartz sand in which there is a high percentage of the coarsest grades. The average depth of the loose sand is greatest in the central area and least in the northern one. In the former there are great variations, although local differences in this respect are common to all the type with the consequent effect of influencing the moisture conditions of the surface soil.

Smaller areas of this coarse sand are found in other parts of the county. They may differ somewhat from the larger areas in general character and topography but have about the same agricultural value.

The Norfolk coarse sand near China Grove is decidedly coarse in appearance, some of the grains approaching small gravel in size. But the larger proportion of the material consists of medium sand. There is also an appreciable amount of silt and clay in all of the soil section, except the immediate surface layer of the coarsest phases. It is this fine material that renders the surface of many cultivated fields rather dusty, for in most instances the sand grains are not clean nor bleached, at least to any depth.

The surface soil is weathered to a dull-gray color. The subsoil is usually a light brownish gray sand containing, in some instances, enough clay to cement feebly the sand into friable clods on drying. But as a rule the sand of the lower part of a 3-foot section is incoherent. At a little greater depth, however, the material is a coarse reddish sandy clay capable of absorbing and holding moisture well.

It is this substratum that enables this coarse sand to maintain a sufficiently high water content in normal seasons to produce fair crops of cotton, cane, peas, and melons.

The average yield of the former is about one-third bale per acre, and from 200 to 300 pounds of fertilizer are generally used to secure this return. The yield of the minor crops depends, of course, very largely upon seasonal conditions and manner of fertilization. Cowpeas and velvet beans do surprisingly well in good seasons. Sugar cane, melons, peanuts, and forage crops are not grown to any extent, chiefly on account of distance to market and lack of interest in stock raising.

The yield of corn is about 10 bushels per acre. In late years some farmers have adopted the practice of bedding up the land rather deep and planting in the water furrow. The soil is worked back with a single shovel plow and the surface left level. This method is commendable, since drought is the principal menace to corn growing on such a light soil. The deficiency in nitrates is so marked that on this, as well as the other light types, grain can not be grown except with heavy applications of nitrogen-carrying fertilizers or the incorporation of the greatest possible amount of vegetable matter. Deep winter plowing is advisable, for by this means the lower subsoil may be made a reservoir for reserve moisture.

The valuation of most of this type near China Grove does not exceed $12 an acre; much of the rough land on the branches, which is uncleared, is worth less.

The Norfolk coarse sand east of Troy is usually a cleaner and sharper quartz sand than that just described. More of the area has a "whitish," bleached surface, and on uncleared portions black-jack oak and scrubby pines are the principal timber. Some old fields thrown out of cultivation are composed of loose grayish sand to a depth of many feet.

The surface is rolling to hilly, the slopes usually being of moderate gradient compared with those of Orangeburg areas.

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

Mechanical analyses of Norfolk coarse 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.*
23552, 24041.....	Soil.....	5.7	54.3	23.9	7.1	1.7	4.2	2.7
23553, 24042.....	Subsoil.....	4.9	49.3	26.6	7.8	2.2	5.5	3.7

NORFOLK SAND.

The Norfolk sand, which has an extensive occurrence in this county, embraces those upland areas where the surface material, to a depth of 3 feet or more, consists largely of the medium grades of quartz sand.

Compared with heavier soils the inherent fertility is of low degree. While most of the type is, or has been, under cultivation, the crop yields are light, except on recently cleared land or where unusually liberal fertilization is practiced.

On much of the type, however, the returns in normal seasons are better than would be inferred from the general surface appearance of most of the soil. While light colored and incoherent, the surface soil usually contains enough finer material to color the fingers when a sample is handled. At a depth of a few feet the sand usually grades into a moderately compact clayey material very similar to the subsoil of the types classed as sandy loam and fine sandy loam.

This substratum is largely the moisture reservoir. Wherever the sand immediately above it is not too coarse, the capillary movement of water from the clayey sand to the surface soil is fairly effective in maintaining a favorable moisture content in the latter. The physical condition of the zone occupied by the plant roots is thus measurably improved as compared with that of a very deep sand of similar texture. It is also probable that with the moisture, soluble mineral elements from the substratum are brought within reach of the growing crops. In seasons of heavy and continuous rainfall crops suffer quite

as much, if not more, than in years when there is a deficiency. The injury in either case is usually most marked where the sand is deepest, and is minimized where the depth to a consolidated material is least, or where the type approaches the sandy loam. Therefore the depth of the sand has been made the basis of a separation of this type into two phases, although topography and general adaptability to cultivation have also been considered.

Upon the uplands in the northern part of the county the Norfolk sand averages several feet in depth. The surface foot is usually quite light colored and rather loose.

In most instances there is more fine material in the subsoil, so that it is slightly coherent when moist and reddish yellow or light brown in color. The material usually becomes more coherent and darker in color with increase in depth.

On the high ridges near Orion and those west of Beemans Creek much of the type is a loose, gray sand without marked change in color or texture to a depth of several feet. Where the topography is smoother and longer slopes prevail the sand is generally of less depth, more loamy, and consequently better adapted to cultivation. In this region limited areas of deep loose sand occur where "leaching" has been comparatively vigorous and the surface is very light colored. Abandoned fields—and they are most frequently observed on this phase—support a light stand of Bermuda grass and Japan clover where the moisture conditions are best, but in most cases stunted weeds constitute the scanty herbage.

In the northeast part of the county much of the Norfolk sand is quite coarse and light colored, especially those areas adjoining the Ruston sandy loam. A heavy yellowish clay substratum occurs at depths varying from 2 to 6 feet, small areas—many of which are not mapable—are simple accumulations of weathered sand in local depressions.

In the southern part of the area much of the Norfolk sand is evidently derived from somewhat finer textured rocks of Tertiary age. It is not so coarse as that farther north and is frequently underlain by red sandy loam. It here grades into areas of Orangeburg sand.

The areas south of Troy include some very light sand, but most of the type in this vicinity is cultivated. Near Spring Hill and Little Oak it frequently merges into the Norfolk fine sand or grades into some of the red soils. These transitions often include areas of fine sand where the depths to clayey sand is less than 3 feet.

On all phases of this type the lack of humus is so apparent that the necessity of increasing the amount by plowing under green crops can not be insisted upon too strongly. On such light soils a cover crop is especially desirable in order to lessen the oxidation—or wasting away—of the vegetable matter in the soil, since this process is com-

paratively rapid under the climatic conditions of this country. Rather heavy applications of phosphorus and potash will be beneficial with most crops, but the use of nitrate of soda can be avoided if the humus content is liberally increased.

A rotation with cotton or corn once in three years with the early grown forage crops, as sorghum, cowpeas, velvet beans, and winter oats for hay, would give better returns on this light soil than the present continuous cropping to cotton. The yields of cotton are so dependent upon the season, fertilization, and method of tillage that any definite statement regarding the average returns is almost impossible. On the best phases about 1 bale per acre may be grown under favorable conditions, provided liberal fertilization is given. As a rule, from one-third to two-thirds of a bale is the range where from 200 to 400 pounds of commercial fertilizers are used.

Corn yields from 10 to 15 bushels with the usual methods of cultivation. Less fertilizer is generally used than for cotton. An increase in the vegetable matter content of the soil is necessary before any of this type is suitable for corn.

The price of the sandy land ranges from $1 to $2 an acre for the lightest phases remote from the towns to $10 or $15 for the better phases more desirably located. The Norfolk sand constitutes a considerable proportion of the tillable land included in the small farms of the northern part of the county. In general the improvements are rather poor and the evidences of prosperity less than on the sandy loams.

Norfolk sand—heavy substratum phase.—This soil has practically the same mineralogical composition and about the same physical features as the best phases of the Norfolk sand. The areas on the west side of the Conecuh Valley generally represent long slopes or moderately rolling lands, where the surface admits of easy cultivation. The soil is a little more retentive of moisture, and the depth to the sandy clay averages less than in the larger developments of the Norfolk sand. On many of the gently rolling hills overlooking the valley the gray surface sand grades downward to a yellow sandy loam that in turn becomes quite compact at 25 or 30 inches. But the actual extent of this loamy variation is very small and most of the type is essentially a sand.

On the west side of the Pea River the Norfolk sand is generally deeper and somewhat lighter than on the corresponding slopes of the Conecuh Valley. On account of the somewhat finer texture and more favorable topography these areas have been included with the heavy substratum phase.

Near the junction of many of the smaller streams the uplands decline very gradually, so that intervening areas of sandy land of a few hundred acres in extent have very moderate slopes toward the Meadow

areas. The soil in such localities is usually more desirable for farming than sand of similar texture upon the uplands.

The somewhat higher agricultural value of this phase is due in part to more moderate surface slopes and also to the comparatively heavy stratum that is generally found at less than 4 feet below the surface.

The average crop yields are a little higher than on the typical Norfolk sand, and the injury to crops during seasonal extremes is somewhat less, although in this respect much depends upon tillage and general management. As a rule this heavy substratum phase responds a little better to careful cultivation, and may be more economically improved than the lighter phases.

The valuation per acre ranges from about $10 to $20. Some well-improved farms, consisting chiefly of this soil, may be worth more. The rental value is from 2 to 3 bales of cotton "per plow."

The average results of mechanical analyses of samples of the two phases of this type are given in the following table:

Mechanical analyses of Norfolk sand.

Number.	Description.	Fine gravel.	Coarse sand.	Medium sand.	Fine sand.	Very fine sand.	Silt.	Clay.
Typical:		*Per cent.*	*Per cent.*	*Per cent.*	*Per cent.*	*Per cent.*	*Per cent.*	*Per cent.*
23554, 24035...	Soil.....	0.6	10.9	15.1	55.4	6.3	8.5	3.0
23555, 24036...	Subsoil.....	.6	10.5	14.8	54.0	6.9	8.9	4.1
Heavy substratum phase:								
24037, 24039...	Soil.....	2.1	16.1	13.8	41.5	9.6	13.2	3.1
24038, 24040...	Subsoil.....	3.3	13.3	14.9	43.2	10.3	9.8	4.4

NORFOLK FINE SAND.

The surface soil of the Norfolk fine sand consists chiefly of the finer grades of quartz sand. The proportion of silt and clay is usually rather low, and there is not much organic matter, except in the occasional small areas of virgin soil. The color of the cultivated fields is a light gray, and as a rule more uniform than that of the Norfolk sand. This may be due to the somewhat more equable moisture content of the fine sand.

The subsoil is composed of practically the same grades of sand as the soil, and in most instances there is no marked increase in the percentage of finer particles with increase in depth. The color of the soil, however, gradually changes to a pale yellowish gray that becomes somewhat brighter at 3 or 4 feet below the surface, provided the underdrainage is good. Where the latter is less effective the subsoil is either somewhat mottled or is very light colored.

The deeper underlying material is generally a rather close-structured sandy clay which does not seem to possess quite such free drain-

age as the basal material of the coarser types. There is considerable variation in the depth to this substratum, so that its influence upon the water content of the soil section is by no means uniform. These structural differences are of less importance in this type than in the coarser sands, for the capillarity is good and a favorable content of moisture is usually maintained in any case. In very dry periods, however, the deeper phases of the Norfolk fine sand show the effect of drought sooner than the shallow ones.

Some of the type seems to have been derived from or influenced by a sandstone, that has been termed a pseudobuhrstone.[1] The outcrops are not numerous, although from Henderson eastward fragments of the rock, small light-colored bowlders, are found in considerable abundance on some of the hillsides. They are quite as often associated with the Susquehanna fine sandy loam as with the Norfolk fine sand. In the latter case the sand is undoubtedly a local accumulation of siliceous material from this rock. In several such places it was observed to be a sharper, cleaner sand than on less rolling land and in areas associated with the Orangeburg and Susquehanna fine sandy loam. The latter phases have a more smooth loamy appearance of the surface soil.

The small areas of this type afford some good locations for small fruit and truck growing. It is a light, easily tilled soil, and responds well to the rather liberal fertilization most of it requires. The fine sand of the high ridges in the southern part of the county are generally inferior agriculturally to those near Brundidge and Spring Hill. The yields of cotton are perhaps a little higher than on the best phases of the Norfolk sand. The same is true in large measure of corn and forage crops, but in all cases the lack of organic matter in the soil limits crop yields, and applications of commercial fertilizers do not entirely correct this deficiency.

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

Mechanical analyses of Norfolk fine 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.*
24045	Soil	0.3	0.5	1.2	83.6	6.1	5.6	2.8
24046	Subsoil	.0	.3	1.0	82.1	6.6	5.9	3.8

NORFOLK COARSE SANDY LOAM.

The soil of this type is similar to that of the Norfolk coarse sand. It consists of the same kind of material with perhaps an increase in the relative proportion of the finer soil grains. This is observable

[1] Alabama Geological Survey, Coastal Plains Region.

where deep plowing has been practiced, by which some of the clayey subsoil has become mixed with the sand. In such places the usual dull grayish surface color assumes a yellowish tint, and friable clods are often formed.

The subsoil is a coarse sandy loam or sandy clay. The normal color is yellow or bright yellowish brown with a tendency to red in the lower part. Near areas of the Susquehanna fine sandy loam the subsoil is generally a reddish-yellow material. The lower subsoil of practically all the type is sufficiently high in clay to render it rather compact.

The contact between soil and subsoil is indefinite, the relatively loose sand changing gradually to clayey sand at from 10 to 20 inches below the surface. The boundaries between the areas of the type and the areas of Norfolk coarse sand are likewise indefinite, the transition from one type to another being very gradual. As a rule the sandy loam occurs on the local elevations and on slopes above the areas of Susquehanna soils.

The type is of limited extent. The small areas form an irregular belt across the north township, marking the southern limit of the deep, coarse, sandy clay deposit, which is the parent material. The northern areas usually have a coarser and deeper surface soil than those farther south.

This soil endures dry weather well, somewhat better perhaps than extreme wet periods. Farmers refer to it as a "tight land," the subsoil being less pervious than that of the Norfolk coarse sand. For most crops it is generally preferable to the latter on account of the heavier subsoil.

The mechanical analyses of representative samples of this type are given in the following table:

Mechanical analyses of Norfolk coarse 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.*
24043	Soil	5.5	25.4	19.8	24.1	10.3	11.4	2.8
24044	Subsoil	3.3	15.2	14.2	15.8	11.6	12.6	27.2

NORFOLK SANDY LOAM.

The soil of the Norfolk sandy loam, to a depth of 10 to 12 inches, consists largely of the medium and finer grades of quartz sand, although there is generally enough of the coarser particles at the surface to give the material of the upper part of the soil a rather coarse texture. The content of silt and clay, which is rather low in the first few inches, increases perceptibly with depth, and the lower part of the soil may be sufficiently coherent to form clods when

brought to the surface, though these are easily broken down in cultivation.

The surface color is gray or sometimes light-brownish gray. Even in old fields there is seldom the bleached appearance common to some of the less coherent sands. Iron concretions are usually present in both soil and subsoil. They are most abundant on the surface of old fields, where the sandy soil is but a few inches deep.

The subsoil is a yellow sandy loam, tending with increase of depth to become more clayey and consequently harder and firmer than the upper portions. The underlying material, or substratum, is generally a reddish-colored sandy clay, resembling the Orangeburg subsoils. This basal section, as well as the subsoil proper, has a marked capacity for absorbing and retaining water. The capillary power is likewise good, so that in dry periods the moisture is brought within reach of growing plants. The deeper underdrainage is effective, so that very little of this type becomes saturated, as in the case with some of the related types, where in places the underlying material is less porous.

This type is of most common occurrence on the gentle slopes along the west side of the Conecuh Valley. In these areas the Norfolk soil has about the same mineralogical composition as the adjoining Ruston, but the more uniform structure of the subsoil, as well as the smoother surface features of the former, give it the higher agricultural value.

The cultural requirements are practically the same as suggested for the Ruston soil, and as in case of that type most of the Norfolk sandy loam is included in small farms. The value of this land ranges from $10 to $20 an acre, the latter price being asked for the nearly level areas lying west of the Conecuh River and located on the main roads.

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

Mechanical analyses of Norfolk 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.*
23556	Soil	1.3	17.9	18.0	33.4	12.5	12.7	4.1
23557	Subsoil	.6	9.7	10.7	21.1	9.2	10.6	38.2

NORFOLK FINE SANDY LOAM.

The soil to a depth of about 6 inches is practically identical with that of the Norfolk fine sand, being, perhaps, a little darker in color, owing to the higher average moisture content and the slightly less

leaching to which the surface has been subjected. The soil grades downward to a light pale yellowish fine sand only slightly incoherent, there being usually but little increase in the clay and silt above 18 or 20 inches. Below this depth the subsoil is a bright or cotton seed-meal-colored fine sandy clay, becoming heavier and more sticky at 35 to 40 inches. This material is much finer textured and more retentive of moisture than the subsoil of the Norfolk sandy loam, and in some places the lower subsoil is so heavy that the internal drainage is not entirely satisfactory, and in wet seasons the ground becomes miry.

The few areas of this type found lie on the gently rolling to undulating lands in the vicinity of the larger areas of the Orangeburg and the Susquehanna fine sandy loams. It usually occurs on land somewhat inferior in elevation to the red soils. Its differentiation from the above types is probably due to differences in internal drainage, caused either by lower topographic position or to some peculiarity of the underlying strata. The natural drainage is not the best, and some ditching is necessary in depressions and on some of the very gently sloping hillsides.

The area north of Spring Hill may be considered representative of the type. It grades in its lighter phases to Norfolk fine sand, while the heavier soil merges into the Orangeburg fine sandy loam. The latter phase is the fine loamy sand with light-red or reddish-yellow subsoil (Ruston material [1]) occurring in small areas on the tops of the ridges.

This type compares well with the adjoining Orangeburg soil of similar texture. The average crop yields and the value per acre are about the same. It is perhaps a little more easily cultivated and may be so managed that injury to crops during dry periods will be very slight. It is naturally retentive of moisture, and with frequent shallow cultivation a good water content could be almost indefinitely maintained.

The results of mechanical analyses of representative samples of the soil, subsoil, and lower subsoil are given in the following table:

Mechanical analyses of Norfolk fine sandy loam.

Number.	Description.	Fine gravel.	Coarse sand.	Medium sand.	Fine sand.	Very fine sand.	Silt.	Clay.
		Per cent.	*Per cent.*	*Per cent.*	*Per cent.*	*Per cent.*	*Per cent.*	*Per cent.*
24049.....	Soil.....	0.4	3.4	3.4	50.2	28.2	8.7	5.4
24050.....	Subsoil.....	1.0	2.5	3.2	43.8	27.6	10.1	6.6
24051.....	Lower subsoil...	.4	1.5	2.1	33.1	19.0	7.2	36.9

[1] Such areas would have been mapped as Ruston fine sandy loam but for their intricate association with the typical Norfolk fine sandy loam with its yellow subsoil and the small size of such occurrences.

SUSQUEHANNA STONY SANDY LOAM.

This type is characterized by its rough topography and the abundance of ironstone and ferruginous gravel upon the surface. The small areas comprising its total extent in this county form a fairly well-defined belt extending from Olustee and Patsaliga Creeks eastward to the divide between the Conecuh Valley and the extreme headwaters of Buck Horn Creek. In this region the higher portions of the local watersheds are generally narrow ridges and conical hills, rising considerably above the general level of the surrounding country. They owe their topographic prominence to a stratum of heavy clay that forms their summits and whose resistance to weathering is further increased by the protection of the ironstone and gravel scattered over the surface.

Beneath the clay and also in places above it sandy strata occur. On the flanks of the divides and in the depression between there has been more or less reworking of weathered material from these sedimentary beds, forming a soil of variable character.

The upper part of the 3-foot soil section is usually a grayish or grayish-brown medium to coarse sand to sandy loam, while the subsoil is usually a stiff plastic red or reddish-yellow clay, with but little sand and often mottled with gray. In places the lower portion of the subsoil is a reddish micaceous sand with barely enough clay to cause it to cohere when wet.

On the upper part of the conical hills and on many of the higher ridges the sandy soil is but a few inches deep. The subsoil is a heavy, tenacious clay, usually micaceous, though some of it contains so little sand that it is nearly impervious. Such areas generally have a red, brown or purplish color, while the physical structure suggests a material of inferior value as a soil.

On the lower slopes and along the ridges where the topography is somewhat smoother the sandy soil is deeper, and the subsoil is generally a sandy clay. Limited areas may be very similar to the Orangeburg sandy loam or Norfolk sandy loam, but much of its surface is more or less encumbered with fragments of iron ore. On the more gentle slopes this type merges into the deep Norfolk sand.

East of the Conecuh River, opposite Linwood, the type covers some high ridges overlooking the valley, while farther east rough-broken country around the heads of the small streams has been included with the type. As a rule the flanks of these elevations are sandy, while heavier phases of the soil are found on the upper slopes or narrow crests. The latter are generally very stony.

The materials composing much of this soil are highly siliceous. The clay stratum is not a good soil making material. The ferruginous content, of course, adds nothing to the fertility. A very small area is

cultivated. This consists of a few rocky ridges where the soil is a dark-red sandy loam with abundance of iron ore. As a whole the type has little agricultural value. It could best be used for Bermuda pasturage and timber.

The original timber cover consisted chiefly of pine. There was probably a larger proportion of the longleaf pine than of any other species on this type. The present growth on the rock ridges is small and scattering, with a larger admixture of black-jack oak. In the ravines the forest is more varied in character and includes some good oak and occasionally poplar and hickory.

The present value ranges from $5 to $10 an acre, although any considerable tract usually includes a greater or less acreage of more desirable types.

The following table gives the average results of mechanical analyses of the heavier phase of the type:

Mechanical analyses of Susquehanna stony 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.*
24086, 24088.....	Soil.....	2.5	10.9	11.6	46.0	9.7	11.7	7.1
24087, 24089.....	Subsoil.....	.7	4.0	4.6	15.9	12.0	21.9	40.8

SUSQUEHANNA SANDY LOAM.

This is a somewhat anomalous type occurring in the broken areas along some of the streams. It owes its origin to the exposures of the heavy bed of light-colored clay to which reference was made in the section on soils. The clay has not weathered evenly, there being more difference in this respect within comparatively limited areas than is usually observable in other types of somewhat similar origin.

On many of the steeper hillsides the sedimentary clay is but slightly changed to within a foot or two of the surface, the overlying material being chiefly sand washed down from the slope above. Where the gradients are more moderate, as on the secondary elevations that often form low hills or irregular mounds and ridges between the foot of the main divides and the valleys, the clay has suffered deeper weathering and the upper part is more generally mixed with sand.

In the latter locations the soil is usually a medium to coarse grayish sand of variable depth, while the subsoil is a rather compact sandy clay, becoming less sandy and more nearly impervious with depth.

The small areas northeast of Troy occur in a rather extensive depression that is separated from the river valleys on the north by ridges of Orangeburg sandy loam. The Susquehanna soil in this locality is generally a grayish micaceous sand with more or less iron concretions,

and in places a considerable quantity of small fragments of conglomerate.

The subsoil is a reddish, plastic sandy clay, not so uniform in color or structure as the Orangeburg material, being mottled frequently with yellowish and grayish colors. In places streaks of clay occur, while near by the subsoil may be a crumbly micaceous sand to considerable depth.

The minor areas mapped on Buck Horn Creek and in a few other localities usually consist of hilly to broken land where quartz sand of variable depth overlies a yellowish or reddish-yellow sandy clay. Such areas frequently grade into areas of Ruston sandy loam. Usually the former have a heavy tenaceous subsoil and are more difficult to till and less productive than either the neighboring Norfolk sand or the Ruston soil.

In general the type is not well adapted to cultivation. Besides having a rough, uneven surface, the soil is chiefly composed of quartz sand, while the clay from which the subsoil is largely derived is probably not so productive as a residual clay from limestone or mixed shales. The yields of cotton, corn, and small truck are rather variable and dependent in great measure upon favorable seasons. Those phases having a red sandy clay subsoil are usually most productive. The clay hillsides should remain forested or be utilized for pasture.

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

Mechanical analyses of Susquehanna 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.*
24084	Soil	3.8	13.6	15.4	39.0	15.5	11.0	2.1
24085	Subsoil	.6	6.1	8.2	20.7	5.0	17.8	41.3

SUSQUEHANNA FINE SANDY LOAM.

The soil of the Susquehanna fine sandy loam, to a depth of 6 or 8 inches, consists chiefly of the finer grades of quartz sand. In forested areas the surface is dark colored and loamy through the addition of humus, but in old fields the more sandy phases are light gray, tending to reddish brown where the depth to the clay subsoil is less than 5 or 6 inches.

The subsoil is a heavy red plastic clay, more or less mottled with drab, particularly in the lower portion. It is probably derived mainly from a light-colored joint clay that seems to be of sedimentary origin. A part of the material is apparently from the associated calcareous rocks and marl.

Two rather distinct phases of the type occur in this county. One has been developed in the northern part along the outcrops of the Cretaceous deposits. In the southwest part of the county exposures of calcareous rocks of Tertiary age have given rise to a soil of similar character but differing somewhat from the northern areas in topography and surface appearance.

In the vicinity of Logton the Susquehanna fine sandy loam occurs on the hilly to somewhat broken uplands of that region. With the exception of some small stony hills and the steeper inclines near the branches, all of it is tillable. The soil here is generally a medium to fine quartz sand with a noticeable amount of mica flakes. There is a good deal of ferruginous material in some form, usually as small concretions upon the surface, although slablike fragments of iron cemented sandstone are often encountered. They are very abundant on the summits of some of the hills. The proportion of silt and clay in the first few inches which gives the soil some degree of coherency and loaminess, varies greatly within short distances. The soil of the more shallow phases is a reddish fine sandy loam, and the plow frequently turns up the hard red clay. On the crests of the wider divides where the surface is less rolling, the sand is generally deeper and the transition to the heavy subsoil is more gradual.

As a rule the subsoil of the Logton areas is a dark-red stiff clay, becoming somewhat lighter in color and more or less mottled at 3 to 4 feet below the surface. In places it grades downward to marl or rock, but such exposures are less frequently observed in this type than in the areas of Susquehanna clay. While impervious, it absorbs moisture slowly and also holds it tenaciously.

Where the sandy soil is deepest and also in most places where this type borders the Norfolk or Ruston soils, the subsoil of the Susquehanna is more frequently a light-red clay with a sufficiently high content of sand to change the heavy clay to a more porous grainy material. In this case it more readily absorbs the rainfall and also gives better internal drainage, as indicated by the prevalence of red and brown tints to greater depths.

The small areas of Susquehanna fine sandy loam near China Grove are derived in part at least from the exposures of the calcareous strata, which in this locality are so generally buried beneath the coarse red sandy clay. Where the soil is apparently residual, as is often the case, the surface is a fine sand, changing rather abruptly at a depth of a few inches to compact red clay. In many instances there has been some admixture of sand from the adjoining areas of Norfolk coarse sand, so that the soil is of variable texture.

The somewhat hilly area northwest of Shady Grove, on Olustee Creek, has a sandy soil of variable depth, with iron concretions and some conglomerate fragments on local elevations. The subsoil here

varies from a rather heavy sticky red clay with little sand to a red sandy clay similar to the heavier phases of the Orangeburg type.

Most of the type in the northern part of the county has been in cultivation many years. Cotton is the principal crop, the average yield being about one-half bale per acre. Most of the land has suffered from long-continued cultivation to this crop, "gall spots"—exposures of the hard red clay—being common in old fields, with deeper accumulations of sand in the depressions. The store of humus has been greatly depleted, and the soil is badly in need of organic matter. The texture of the soil would also be improved in most cases by deep plowing, so as to mix the sand and clay.

In the southwestern part of the county the Susquehanna fine sandy loam is usually less ferruginous than in the northern township. The surface is seldom gravelly, and the subsoil is a lighter shade of red, having in many instances a peculiar brownish-red or dark snuff color. The topography is somewhat bolder than that of the larger areas in the northern side of the county, the marls and soft limestone of the latter section yielding more evenly to weathering and erosion than the harder lime rock so frequently exposed in the lower part of the county.

The soil is usually a grayish fine sand having a rather soft loamy feel, due to the absence of large grains and the presence of a high percentage of finer particles. The depth varies from a few inches on the higher divides and upper slopes to a foot or more on the lower hillsides and in the local depressions. In nearly all old fields there are numerous "gall spots" caused by the removal of the original thin covering of sand by erosion.

This sand is doubtless the siliceous residue from the limestone, for the latter is somewhat arenaceous. Fragments of the limestone are sometimes found in the soil and also small pieces of a light-colored sandstone, probably the weathered remains of a pseudobuhrstone occurring in the Tertiary series of the locality.

The subsoil is a heavy granular clay very tenacious and closely structured, especially in the vicinity of the limestone outcrops. On the more gently rolling sections it is frequently found to be underlain by rotten limestone at a depth of a few feet, but for the most part the subsoil of tillable areas is not calcareous, even at such depths as are usually observable in roadside cuts. The stiff granular clay extends to considerable depth without essential change in composition except that the upper portion is a darker red and more affected by weathering. On the lower slopes it is frequently a red sandy clay, heavier and somewhat more granular in structure than the Orangeburg subsoil but otherwise resembling it and having about the same physical properties.

The area on Bluff Creek includes much land too rough to be tillable. The same is true of smaller developments of the type on other streams. On the wide crests of the main divides undulating to moderately hilly land in bodies of 200 or 300 acres is found. The light-gray fine sand of the surface frequently has a rather bleached appearance, and the land is said to be very poor. This is due in a large measure to the exhaustion of the humus, but also to the fact that the slow absorption of rainfall by the heavy subsoil occasions more frequent alternation of saturation and dryness in the surface soil than occurs on the land having a more sandy subsoil with consequent better absorption and capillarity.

The areas near Little Oak and eastward toward Spring Hill resemble the Orangeburg fine sandy loam in color and general agricultural value. No close distinction could be drawn between the two types, the somewhat more clayey subsoil of certain sections being the basis of separation.

The general agricultural value of the several phases of this somewhat variable type may be inferred from the description of the physical features. While but little of the type is calcareous the influence of lime is observable in the granular structure of the subsoil. In some instances free lime is near enough to the root zone favorably to affect lime-loving plants and possibly to react upon the humus of the soil. Such phases should be selected, where the physical conditions are reasonably good, for grain and grass crops. A liberal increase in the humus content would give a comparatively high degree of fertility, with but light applications of commercial fertilizers. The latter are in general use for cotton. About the same kinds and similar applications are given on this as on other types.

In the southwestern part of the county those phases of this type resembling the Orangeburg fine sandy loam are valued at $20 to $30 an acre. The rougher sections below Henderson, and farms consisting of cleared ridge land with more or less broken or stony ground near the streams, range in value from $10 to $20 an acre. The rental value of the best phases is about 2 bales of cotton "per plow;" of the old land, where the surface is more or less hilly, 1 to 2 bales.

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

Mechanical analyses of Susquehanna fine sandy loam.

Number.	Description.	Fine gravel.	Coarse sand.	Medium sand.	Fine sand.	Very fine sand.	Silt.	Clay.
		Per cent.	*Per cent.*	*Per cent.*	*Per cent.*	*Per cent.*	*Per cent.*	*Per cent.*
24090, 24092, 24094.	Soil.....	0.7	2.1	2.7	46.8	29.0	14.0	4.7
24091, 24093, 24095.	Subsoil.....	.2	1.1	1.6	31.0	13.7	14.6	37.7

SUSQUEHANNA CLAY.

This type is closely associated with the Susquehanna fine sandy loam of the northern part of the county. No sharp distinction can be drawn between the two, for the latter in many instances has been changed to the clay type through the removal of the surface sand by erosion since the land was cleared of the original sandy covering. Some of the larger areas of Susquehanna clay near Logton and between China Grove and Orion, however, seem to have originally had only a very thin surface accumulation of sand. Here the type is residual and the material from which it is derived is but slightly arenaceous; consequently there is little sand except that transported by surface wash or wind drift from the lighter soils near by.

The Susquehanna clay represents the least sandy phases of the residual clay derived for the most part from the calcareous strata of the Ripley series of the Cretaceous. Exposures of impure limestone or marl are common throughout the area where this soil occurs, and in places fossil shells and lime nodules are found upon the surface.

In general the material to a depth of 2 or 3 feet consists chiefly of a red, plastic clay, containing a little very fine micaceous sand and in places ferruginous gravel. The lower subsoil is lighter colored, frequently mottled with red, gray, and iron stains of various shades of brown, and grades downward to dull grayish clay, which in places seems to be the immediate residue of the limestone or marl beneath. In many cases a boring to a depth of 3 feet reveals the rotten limestone or clay containing free lime. The main portion of the type is probably derived from the clay beds of the parent formation, calcareous material entering into only a portion of the type.

Under the usual moisture conditions the weathered upper portion is stiff and compact, with a marked tendency on drying to crack into angular blocks. When wet it is very sticky and coherent, difficult to manipulate with any implement, and forms exceedingly heavy, miry roads.

The virgin soil is a very fine sandy loam to a depth of 4 to 5 inches. It is very friable and loamy, the humus content being high, easily cultivated, and very productive. It yields so readily to erosion that in all cleared land the surface conditions are entirely changed in a few years. The humus is lost, the fine sand is largely accumulated in local depressions or washed bodily into the streams, while the iron concretions, hardly observable in new land, become abundant upon the local elevations and steeper slopes. The present surface of most of this type is a red clay, often badly eroded in old fields. In places it is more or less sandy, although the latter phases, where of sufficient extent to be shown on the map, have been included with the sandy loam.

Near Logton the surface is hilly to rolling with occasional stony crests. Iron concretions are very numerous in places, although their occurrence is rather erratic, some of the ground being almost entirely free from them. Between Briar Hill and Kent much of this type is only moderately hilly, long easy slopes predominating. With occasional exposures of calcareous material in the shallow, roadside ditches. The large area northeast of Orion has also very moderate relief. Practically all of these areas are tillable.

On the south side of Olustee Creek and along a few other streams the narrow areas of Susquehanna clay represent a steep hillside occurrence of plastic red clay closely associated with exposures of the limestone or marl, giving rise to a red clay. As a soil it is of variable nature due to creep and wash of sand from higher ground adjoining. With the exception of a few narrow benchlike strips more or less sandy at the base of the hills, these areas have little value except for pasture or timber.

The native vegetation consisted of a mixed growth of shortleaf pine and hardwoods. White, red, and post oak were numerous, also large specimens of the black-jack oak. Hickory and poplar were abundant, especially near the streams. On abandoned fields, and they are quite numerous between Orion and Logton, shortleaf pine is the dominant species.

The Japan clover is especially abundant on this soil, and occasional bunches of Melilotus are seen on the more calcareous phases. Bermuda and Johnson grass thrive wherever they obtain a foothold and indicate the adaptability of this type to grass.

Most of the Susquehanna clay has probably a high degree of potential fertility, but its physical structure renders it difficult to manage and consequently unfavorable conditions often prevail during the growing season. Most of it would be greatly benefited by plowing under green manuring crops. This would improve the physical condition, increase the nitrates, and render more soluble the mineral elements that in the present condition of the clay are largely unavailable to plants.

The yield of cotton is about the same as on the Susquehanna sandy loam, with the exception that poor tillage or seasonal extremes make a more marked difference than on the latter type. Much of the type is in bad condition, owing to careless cultivation by tenants.

The price per acre of the Susquehanna clay ranges from a few dollars for the roughest areas on the streams to $15 or $20 an acre for gently rolling lands near the railroads.

The average results of mechanical analyses of samples of the soil, subsoil, and lower subsoil taken between Logton and Briar Hill, are given in the following table:

Mechanical analyses of Susquehanna clay.

Number.	Description.	Fine gravel.	Coarse sand.	Medium sand.	Fine sand.	Very fine sand.	Silt.	Clay.
		Per cent.	*Per cent.*	*Per cent.*	*Per cent.*	*Per cent.*	*Per cent.*	*Per cent.*
24096, 24099...	Soil.....	0.4	1.1	1.1	10.4	20.1	31.3	35.5
24097, 24100...	Subsoil.....	.0	.1	.3	3.2	7.5	27.7	61.1
24098, 24101...	Lower subsoil...	.0	1.1	1.4	10.1	16.7	33.7	36.9

RUSTON SANDY LOAM.

To a depth varying from 6 to 15 inches the Ruston sandy loam consists of a gray loamy sand principally of the medium and coarse grades of quartz sand. Mica flakes are usually present in noticeable numbers in a hand sample, but there are comparatively few visible particles that in shape or color suggest minerals of other kinds. In most instances there is more or less ferruginous material, consisting chiefly of small gravel and stone. Below the immediate surface layer the finer particles of the oxide as well as the presence of some clay give a slight degree of coherency to most of this sand.

There is seldom any definite line of demarcation between the soil and subsoil, and the change of color and composition is generally more gradual than in the Orangeburg or Norfolk types of the same class.

The subsoil in most places is a fairly friable light-red or yellowish-red sandy clay, the color being intermediate between the red of the Orangeburg and the yellow of the Norfolk. It has a rather coarse gritty feel, the grains being angular rather than rounded, which probably increases the porosity of the material as a whole. Mica particles are numerous, and iron concretions in some form are seldom wanting, although their distribution is erratic. Where the subsoil is fairly uniform in color and structure for considerable distances, as is the case in the more level areas, the iron concretions may be lacking, or if present, only in the form of occasional small pebbles. Where the subsoil is of varying character or streaked with clay layers, there is generally an increase in the content of ferruginous material.

The more noticeable changes in the original character of the material do not usually extend to a greater depth than a few feet. On the hillsides stratification is often apparent in the lower part of the subsoil, usually to the detriment of an equable distribution of soil moisture. Flakes and streaks of pipe clay occur in highly arenaceous layers, or occasionally the argillaceous material forms thin, impervious strata, seldom extending for any considerable distance laterally. Much of the crossbedding represents varying proportions of

the quartz sand, fine clay, and mica flakes in the respective layers. Fortunately the agencies of weathering tend to obliterate these physical variations and to reduce the mass to a homogeneous mixture of sand and clay of more equal permeability to rain water, and of greater capillary power. In this respect the type is generally inferior to the Orangeburg and Norfolk sandy loams, there being less depth to the substratum which forms a part of the moisture reservoir and favorably influences internal drainage and aeration.

The type is of rather extensive occurrence in the north part of the county. The more hilly portions of the divides between the headwaters of Indian, Beemans, and Mannings Creeks include many areas of this soil. Much of it is hilly to somewhat broken in topography, and the crests of the ridges and higher points are usually thickly strewn with iron concretions. On the hillside the reddish sandy clay is frequently exposed. The shallow sand or sandy loam in the vicinity of these rough places is generally stony. The latter areas resemble the Susquehanna stony sandy loam. Toward the south the surface of the Ruston soil usually becomes less rolling and merges into the smoother topography of the Norfolk sand and Norfolk sandy loam.

Near the Susquehanna clay or the Susquehanna fine sandy loam the Ruston sandy loam has a finer texture and the subsoil is a red sandy clay. Some of these areas, although usually of limited extent, are similar to the thinner and more gravelly phases of the Orangeburg sandy loam. They are the best phases of the type where the surface is not too hilly. In this phase may be included the occasional areas in the southern part of the county.

In the northeast corner of the county the Ruston sandy loam is a moderately coarse sand of somewhat variable depth with a yellowish sandy clay subsoil. Here the type owes its origin in part to exposures of the bed of light-colored joint clay. Some of the small areas near Buck Horn Creek have a decidedly heavy subsoil and the underdrainage is frequently poor.

As a rule this soil endures dry weather better than periods of unusual rainfall.

The original forest was mostly pine, with considerable oak. The latter, however, consisted largely of black-jack oak, post oak, and other species not generally so desirable for timber as the varieties found on heavier soils.

Much of this type is included in small farms and consequently a large proportion of the whole is cultivated. The variations in the physical features determine in large measure the actual agricultural value of any particular area, or rather of any part of a field, for uniformity in depth of the sandy surface soil and the character of the subsoil is the exception.

The red phases of this type, if the lower subsoil is not too heavy, compare favorably in crop yields with the Orangeburg soils. The least hilly areas are similar to the Norfolk sandy loam in crop value.

The lack of organic matter and the highly siliceous character of the material render the use of complete commercial fertilizers necessary for corn and cotton. The yields are rather low, but vary so widely with difference in local conditions, methods of culture, and of fertilization that a statement of average yields is difficult to make.

The returns for 1909 and 1910 are much below one-half bale per acre. The average for a number of years past is somewhat more than this estimate. Corn makes from 10 to 15 bushels per acre, but on some farms this is exceeded. The average yields of the minor crops are perhaps a little higher than on the best phases of the Norfolk sand.

Much of the Ruston sandy loam is easily susceptible of improvement by the methods already outlined. The stony areas and some of the badly eroded hillsides are of little value except as pasture or forest lands.

The value of improved land of this type is between $10 and $15 an acre. The lighter phases and those areas bordering on the deep sands or stony sandy loams are worth but $5 or $6 an acre. The rent paid for farms consisting largely of this type is from 1 to 2 bales for a one-horse farm, 20 to 30 acres.

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 Ruston 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.*
24080, 24082.....	Soil.....	2.2	12.6	20.4	40.1	7.4	11.4	5.6
24081, 24083.....	Subsoil.....	1.2	7.2	12.8	28.1	4.2	8.0	38.6

KALMIA FINE SANDY LOAM.

The Kalmia fine sandy loam, to a depth of 15 or 20 inches, is a fine grayish sand, mainly quartzitic. The grains are evidently less angular than those of some residual types of similar texture, for the surface of cultivated lands has a soft yielding quality common to fine sands in which there is little binding material and no coarse grains or small gravel. The capillarity is excellent, so that the material is generally moist to within an inch or so of the surface.

The surface color in old fields is light gray, changing with increase of depth to light brownish gray or very frequently to a pale yellowish

tint. In the virgin soil and also in depressions where there is considerable vegetable matter the color is much darker.

The lower subsoil is generally a soft plastic yellow or pale yellow fine sandy clay frequently mottled with grayish colors in the lower portion. The depth at which the fine sand grades into this heavier material varies considerably, but the latter is almost invariably found at less than 24 inches, the only exception being near the base of the adjoining hills, where the sand is deeper and also coarser.

The larger areas of this type are found on the west side of the Conecuh River. They are low second bottoms, having an elevation of from 3 to 10 feet above the adjoining Ocklocknee soils. There is usually a rather well-marked boundary between the two types, a sharp drop of a few feet or a slight slope. Similar elevations occur on the west side of the Pea River in a number of places; also on the lower courses of the larger creeks. In the latter instances and also in the upper Conecuh Valley the boundary between this type and the Meadow or other alluvial soils is not so well defined. The outer edges of the overflow land frequently rise imperceptibly to a narrow bench of land that is above the reach of the highest floods.

This type, locally termed Hammock land, affords some rather small areas of fine farming land. The surface is moderately undulating. The natural drainage of most of the areas is fairly good. There are some pondlike depressions in the larger areas, and small streams from the hills cross them at frequent intervals or wind along the side nearest the stream.

In seasons of heavy rainfall much of this type drains rather slowly. This is due in part to the generally low gradient, but also to the retentive nature of the soil and subsoil. In the summer of 1910 the water table was not generally found within 40 inches of the surface, except in local depressions or near the bordering Meadow, but in a good many instances on moderately high ground the light-gray color of the lower sand and the mottled yellow and gray color of the sandy clay beneath it indicated a lack of underdrainage and aeration. This, of course, can only be remedied by ditching.

The uncleared areas of this type support a mixed forest similar to that on the least swampy Ocklocknee soils. The soil here is a black humus-laden fine sand, with the clayey subsoil nearer the surface than is usually observed in the more elevated areas. The latter are nearly all cleared, some having been farmed for 50 or 60 years. The fields are free from stumps and the light soil is easily tilled.

This land when new will produce upward of 25 to 30 bushels of corn or about 1 bale of cotton per acre. The yields on the old land are less, for the soil in many cases has practically no humus. The present average production is perhaps one-half or one-third of that

obtained on recently cleared land. Sugar cane and forage crops should give good results.

With increase of the vegetable-matter content of the soil, and in places better drainage, this land could be raised to a comparatively high degree of productiveness. While the soil mass consists largely of quartz sand, its alluvial origin suggests the inclusion of minerals of more varied composition and greater value as soil constituents. With an increase in the humus supply the present use of mineral fertilizers could be largely reduced or their efficiency greatly increased.

This land has usually no improvements except some fencing, being considered too low to be healthful. Some of the small areas are not well located with respect to public roads. It is not generally for sale, except in connection with larger tracts of upland or as a part of the timbered land between it and the stream.

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

Mechanical analyses of Kalmia 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.*
24031, 24033.....	Soil.....	0.2	1.1	3.5	48.1	28.4	12.1	6.3
24032, 24034.....	Subsoil.....	.0	.5	2.0	35.7	22.4	13.9	25.4

KALMIA SAND.

The Kalmia sand consists of 3 feet or more of sand, the coarser grades usually predominating. The relative proportion of the constituents varies so much in different places that the appearance of the surface and the character of the subsoil are by no means uniform in any of the small areas indicated upon the map.

Generally the soil is a gray quartz sand too open and devoid of fine material and humus to hold moisture well. The subsoil has the same mineralogical composition and the water content depends chiefly upon local drainage conditions.

Some of the small areas of this type are comparatively recent accumulations of sand washed from the adjoining hillsides. The larger developments are either low terraces at the junction of streams or very gently sloping inclines at the base of sandy hills. In many instances the outer part of the Meadow, where the latter is bordered by Norfolk or Orangeburg sand, is a phase of this type, but it is impractical to outline these narrow strips of colluvial soil.

The type is unimportant agriculturally. The more loamy phases or the low places which may be drained have about the same crop adaptations as similar sandy types of the uplands and river terraces,

being a little more retentive of moisture, perhaps, and somewhat better suited to corn and sugar cane.

Owing to the variable texture of the type, no samples for mechanical analyses were collected.

KALMIA FINE SAND.

The soil of the Kalmia fine sand, to a depth of 5 or 6 inches, is composed chiefly of fine siliceous sand. A hand sample has a rather smooth, loamy feel, there being but few coarse grains in it. The color is usually light gray. In some instances it has a faint yellowish tint, where the underlying clayey material is found at less than the average depth. In old fields the deepest and least coherent phases of the fine sand have a very light or somewhat bleached appearance. The virgin soil and also that in most of the depressions is much darker colored and decidedly more loamy.

The subsoil is a light-brown or pale yellowish gray fine sand grading at 25 or 30 inches to fine sandy loam. The amount of silt and clay in the latter rapidly increases with depth, and it becomes a firm compact material, the brown color changing to light red. Some soft iron concretions occur in the subsoil.

The type is found on the second bottoms of the larger streams. In the upper Conecuh Valley it occupies the rather high terraces on the west side of the river. The surface of these areas has a pronounced slope from the hills to the margin next the flood plain. They are crossed in so many places by small branches that much of the surface is more or less undulating with a good many depressions requiring artificial drainage. The soil of the more level areas is finer in texture and the depth to a clayey sand is less than on the slopes nearer the hills.

The small areas on Olustee Creek near the Susquehanna clay have a heavy subsoil and the surface sand is not so deep as on the larger areas farther down the streams. A part of the former are fine sandy loams but have been included with the fine sand.

The area of Kalmia fine sand on Pea River is a level to slightly undulating tract lying between the foot of the second terrace and the flood plain or "swamp." It does not form so distinct a second bottom as the Cahaba soils usually occupy, but is well above the reach of the highest floods. There are frequent depressions near the foot of the terrace that are more or less in need of drainage. The soil in these places is not only darker and more loamy than the average but the subsoil is frequently a sandy clay.

With the exceptions noted the type has good natural drainage, and also maintains an excellent moisture content. It is easily tilled and highly susceptible to improvement. Like the Cahaba types of this county it consists so largely of quartz sand that mineral fertilizers

will always be necessary, especially on the lighter phases. Some of the latter produce good crops for 8 or 10 years after clearing, but subsequently the yields decline and continue low. The chief cause is doubtless the exhaustion of vegetable matter. Where the latter is still present, as in the local depressions, fair returns are secured. On one well-tilled farm good yields of winter oats, corn, and various forage crops are secured with the use of but little commercial fertilizer. All available vegetable matter is plowed under and light applications of manure made, a spreader being used to insure even distribution of the latter. The average yield of cotton is about one-half bale per acre.

Much of this soil is well adapted to sugar cane, watermelons, cantaloupes, sweet potatoes, and other truck crops. Its somewhat higher position renders it a little safer for early crops than most of the Kalmia fine sandy loam, which in many respects it resembles.

The average results of mechanical analyses of samples of the soil and subsoil of the Kalmia fine sand are given in the following table:

Mechanical analyses of Kalmia fine 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.*
24015, 24017.....	Soil.....	0.9	5.7	8.1	52.2	19.1	11.2	2.6
24016, 24018.....	Subsoil.....	.9	4.7	7.3	54.2	17.8	10.7	4.1

CAHABA SAND.

The surface soil of the Cahaba sand is a light-brown to brown rather loamy sand. The color usually becomes lighter in those places where the texture is generally coarser and the material has suffered some leaching. The humus content is low, so that the coloration and the physical properties mentioned are due mostly to the mineral constituents.

The subsoil usually contains more of the finer grades of material than does the soil. It is a light-brown or yellowish-brown medium sand in which the content of clay and silt increases with depth. The lower part is frequently a very light sandy loam with slightly reddish tint, the color and degree of compactness both becoming more pronounced with increase of depth. In most instances, however, the material consists largely of sand to a depth of 3 feet or more.

The substratum is a reddish-brown sandy loam. On the short slopes near the streams it is, in many instances, a red sandy clay resembling Orangeburg material. Rather obscure stratification exists, and there is some development of brown iron crusts, usually thin, soft layers of irregular occurrence. This basal material, while much

more retentive of moisture than the subsoil proper, is not impervious, and as a rule very favorably affects the moisture conditions of the latter.

This sand is the prevailing type upon the high terraces west of the Conecuh River. Limited areas are level, but most of the surface is undulating with short, steep slopes near the river and along some of the tributary streams. The latter cross this bench land at frequent intervals north of Goshen and some of the surface is somewhat rolling, the original level being represented by the nearly flat tops of comparatively wide divides. The latter have a gentle inclination from the foot of the hills on the north toward the river. The drainage is generally good and cultivated fields extend to the margin of adjoining low land.

South of Goshen the surface is not so well drained naturally.

There are frequent small depressions where artificial outlets have been provided. In these low places the darker colored and more loamy soil is generally underlain by a heavy subsoil.

Most of this type has been in cultivation many years. Recently the yields of cotton have ranged from one-half to 1 bale per acre. Excessively wet seasons reduce the production more than dry ones. The soil is inclined to extremes of saturation and dryness on account of rather open structure and the lack of humus. Even slight additions of the latter have a most marked effect upon the color and vigor of cotton plants. The usual application of fertilizers, about 200 pounds of a 10–2–2 formula, fails to furnish the requisite amount of nitrates and makes no improvement in the physical condition of this light type. It would be greatly benefited by plowing under a crop of cowpeas sown broadcast once in two or three years. The injurious effect upon the soil of the clean culture of cotton could be counteracted to some extent by a cover crop of winter oats or rye. In a soil so highly siliceous some mineral fertilizers will be necessary, but the supplying of humus is the more important step in attempts to increase the yields of cotton and corn. The yields of the latter are generally low, seldom exceeding 25 bushels, and in most instances being nearer 15 bushels per acre.

The comparative ease with which labor-saving implements can be used on this type, as well as the associated sandy loam of the same series, renders it desirable for general farming. All these types can be more economically cultivated than the hilly upland types.

The Cahaba sand is well adapted to the culture of sugar cane for sirup. While the dark loamy phases of the depressions make the larger yields, a better flavored and lighter colored sirup can be obtained from the cane grown on the higher ground.

Favorable locations for all truck crops requiring a light sandy soil can be found, but very little of this land is devoted to such purpose.

The value of land of this type of soil ranges from $15 to $20 an acre. Some well-improved farms near Goshen are held at higher prices.

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

Mechanical analyses of Cahaba 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.*
24011, 24013.....	Soil.....	1.0	10.3	14.3	41.8	12.7	15.4	4.1
24012, 24014.....	Subsoil.....	.6	9.5	13.7	45.0	11.6	13.5	6.2

CAHABA SANDY LOAM.

The soil of the Cahaba sandy loam is practically identical with that of the Cahaba sand. The subsoil, however, is a sandy loam, usually of a rather bright yellowish-brown color, in which there is enough clay to make it quite sticky if wet. In most instances it is crumbly or coarsely friable, though quite retentive of moisture.

The subsoil is generally a light-red or mottled red and brown sandy loam, not essentially different from the substratum of the Cahaba sand.

The largest area of this type is found on the terrace west of Orion Bridge. This tract of comparatively level land has a gradual inclination from the north toward the river; the elevation of the lower margin is perhaps 25 to 30 feet above the flood plain. There are a number of shallow depressions, formerly ponds, that have been drained. In these the subsoil shows a lack of aeration. On some of the slight elevations and along the foot of the hills to the north the sand is deeper and usually lighter colored. A few small areas of the type occur on all the bench lands of the larger streams, but in general the depth to material heavy enough to be classed as a sandy loam is so variable, usually more than 30 inches, that most of these areas have been included with the Cahaba sand.

While the sandy loam is to be preferred to the sand for most purposes, there is little difference in the present crop yields or general agricultural value. The heavier type is a little more drought resistant, and with deep plowing and incorporation of vegetable materials can be made the more loamy of the two. It is also probable that the loss of plant food by leaching during wet seasons is less in the sandy loam than in the sand, but this tendency is so subject to modification by methods of tillage and amount of humus in the soil that it is relatively unimportant.

Practically all of this type is cultivated. The valuation per acre is about $20, the rental value about 3 bales "per plow."

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

Mechanical analyses of Cahaba 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.*
24009	Soil	3.3	14.7	14.1	36.6	11.2	16.1	4.0
24010	Subsoil	1.5	7.6	11.3	36.0	17.8	7.6	18.0

HENDERSON STONY CLAY.

On the ridges overlooking Bluff Creek the fossiliferous Tertiary limestone is frequently exposed. The soil overlying the ledges and in the immediate vicinity is thin and stony.

While the first few inches of the less rocky slopes are generally a fine sand, the subsoil is very heavy and tenacious. In places it is a greenish-gray clay, exceedingly sticky and adhesive. The lower part is frequently rotten limestone or a marly material in various stages of dissolution.

The type is of limited development and unimportant agriculturally. A few of the larger areas are indicated on the map, but in most instances areas were so small that usually they could not be shown on the map. The patches grade into the surrounding Susquehanna fine sandy loam.

BIBB SANDY LOAM.

A small area of the Bibb sandy loam occurs on Panther Creek a few miles below China Grove. The soil is a moderately coarse sand, a foot or more deep, generally ashy gray to nearly white in color, resting on a subsoil of very heavy sandy clay. Owing to the nearly level surface the drainage is poor, and the materials forming the soil and subsoil show the effects of this condition. Over a part of the small area indicated somewhat better natural drainage obtains, and here the soil consists of a grayish sand with a yellowish clayey subsoil. Grasses, as "water grass," carpet grass, and lespedeza, should do well.

OCKLOCKNEE FINE SANDY LOAM.

The Ocklocknee fine sandy loam is developed only to a small extent in Pike County, being found in the southwest part. It consists chiefly of fine material washed from the hills of Susquehanna fine sandy loam. In most instances areas of this character have been included with meadow, on account of the poor drainage. A few areas have been indicated on the map, these consisting in part of

fields having a little better natural drainage than the average, but even in this case ditches are used to remove the excess water.

The soil in most cases is a grayish fine sand with considerable silt and some clay, so that it is quite loamy. Originally it contained much humus, but this is largely exhausted. There has also been more or less recent wash from the adjoining upland, and the texture and surface condition are by no means uniform.

The subsoil is a fine sandy loam grading to a rather stiff heavy clay or sandy clay. As a rule the underdrainage is inadequate, at least in the central parts of the small areas indicated. The subsoil is not permeable, containing too much of the fine clay that is the dominant material upon the hills near by. It has usually a light-gray color, with a tendency to mottling in the lower part.

Where the type is well drained, it is a good soil for general crops, cotton, corn, and sugar cane doing well, with but little fertilization.

OCKLOCKNEE LOAM.

The Ocklocknee loam is represented by some limited areas of alluvium on the headwaters of Beemans and Mannings Creeks, where the soil is derived in part from the Susquehanna soils and in part from wash of the marl and limestone exposures on the adjoining hillsides, as well as the other soils occurring in the drainage basins. Near the outcrops of calcareous clay the alluvium is frequently lighter colored, a dull grayish brown, than where it is a recent wash from the red hills. Fossil shells and nodules of lime are observable in some heavy phases at the foot of the hills, but most of the soil is a sandy loam or loam with a clay-loam subsoil. Most of the small and ill-defined areas between the hills consist largely of recent wash from the latter and are a reddish sandy loam of variable depth. The larger areas on the branches are level bottom land considerably heavier in texture.

In general the immediate surface is usually a fine sandy loam, but a few inches below it is much heavier, a silt or silty clay loam in places, so that when plowed it is somewhat cloddy. The subsoil is a rather compact loam to silty clay loam more granular and crumbly than the subsoil of most of the Ocklocknee soils.

Most of the areas indicated on the map are desirable farm land. They have been artificially drained and where well cultivated produce good crops of corn and cotton. The surface is a little higher and the ditches have better gradient than could be secured in much of the alluvium farther down on these streams. The influence of the lime is also noticeable in the high productivity of this soil where the physical conditions are favorable.

The soil is admirably adapted to the tame grasses common to this section. Alfalfa could be grown on the better-drained portions, preferably those showing most plainly the presence of lime.

A considerable acreage that was farmed before the war has been allowed to revert to forest. There are small areas farther down on the creeks than those shown on the map, which if drained would be similar to the cultivated fields of this type.

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

Mechanical analyses of Ocklocknee 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.*
24056	Soil	0.5	3.3	6.9	36.8	19.5	22.7	10.2
24057	Subsoil	.3	3.0	3.9	29.9	18.5	32.0	12.4

MEADOW.

This generalized type embraces first bottom land on Conecuh and Pea Rivers and on Mannings and Beemans Creeks and areas along other small streams. In common with most alluvial soils, there is considerable variation in color and composition, as well as in local drainage and consequent surface condition.

The greater part of the alluvium on the Conecuh Valley is a heavy clayey soil, in most places silt and clay, constituting a high percentage of the material, and if shown in detail would be classed as types of the Ocklocknee series. Near the stream channel and also along the base of sandy slopes the soil may be lighter; but throughout most of the area subject to annual overflow the sediments are fine and the resulting soils are rather heavy.

In the lower and middle portions of the valley in this county a very common phase of soil is a dark-drab to dull-chocolate colored silty clay or clay. While the content of humus is apparently rather low—except in some semiswampy places—the surface is quite dark.

When dry, it is firm, but not compact, the material usually being somewhat porous and inclined to assume a crumbly or granular structure. The varying content of sand is usually fine and highly micaceous.

There is generally no marked difference in texture between the soil and subsoil. At a depth varying from a few inches to a foot or more the latter is more or less mottled, the basic color being a light gray, mingled in which are various tints of brown occurring in spots and streaks. The peculiar coloration is caused by lack of underdrainage and aeration. On local elevations, where the relief may be several feet above the average level, the soil is frequently a dark-brown, friable or crumbly loam, while the subsoil is a bright yellowish brown, with little or no mottling except at a depth of several feet.

The same phenomena is often observable near the higher river banks and along old channels, where the underdrainage is more complete, than on wide areas of flat ground.

Above Linwood there are numerous small marginal tracts of alluvium sufficiently elevated to escape all except the highest floods. The soil here is usually a grayish sandy loam with rather heavy subsoil. The latter in most cases is not well drained; but with some ditching to relieve the surface of heavy rainfall good crops are produced.

The bottom land on Pea River is similar to that just described. All of it is heavily timbered, and the dark-colored surface soil is generally bare of grass and free from small undergrowth. While most of the ground remains damp throughout the year, the swampy places are of limited extent, usually old half-filled channels. In general, most of the area is traversable without difficulty, except for a few weeks after the winter or spring overflows.

Practically all of this type represents the finest sediment now being deposited by the streams along which it occurs. While the gathering ground of all is predominately sandy, the coarsest material is largely deposited on the smaller tributaries or is dropped near the banks of the main channel at the moment of breaking over the banks. The fine yellowish mud which forms most of the burden carried by the Conecuh during high floods, is deposited only after the waters spread over the flats. It seems reasonable to assume that much of this is contributed by the calcareous terraces of the Cretaceous and the heavy clays outcropping on all the uplands to the northeast of the valley. Of the inherent fertility of such material there can be no question, and it needs but adequate drainage to become a highly productive soil.

All of this bottom land is densely forested. Water oak, black gum, beech, and ironwood are abundant. There is a good deal of white oak and other varieties resembling this valuable tree, but much of this timber, as well as the largest hickory and cypress, has been removed. Some very large swamp and spruce pine are found, with more or less maple, sycamore, birch, and willow.

At the margins of the "Swamp," as most of this overflowed land is locally termed, there is an undergrowth of grass, bushes, and young trees, while in the interior the ground is so continually shaded that this smaller vegetation is almost entirely absent.

The reclamation of the greater part of this rich land seems entirely feasible. The general gradient of the Conecuh and Pea River Valleys is comparatively high. These streams have rather rapid currents despite the tortuous and obstructed channels. Were these straightened and cleared of fallen logs, the minor overflows that now

frequently fill the old channels and keep much of the soil more or less saturated for considerable periods would be entirely prevented and the duration of the larger floods would also be greatly reduced. The latter occur mostly in the late winter and early spring. Summer floods are not of frequent occurrence.

The effective reclamation of these river valleys, especially that of the Conecuh, is apparently a no greater problem than is successfully undertaken by counties, or especially organized drainage districts, in some of the Northern States, where swamp lands have been drained.

On Mannings and Beemans Creeks cooperation between the landowners would render much of the soil, now practically useless, available for corn and grass.

The fertility of all this soil is inexhaustible and the adaptability of most of it to the crops mentioned is unquestioned. Occasional overflows would be no serious menace.

In a few instances some of this land has been entirely cleared of timber, and pasture consisting chiefly of Bermuda and carpet grass has been successfully established. Much of it could be so utilized if stock raising were more generally practiced by the owners of the farms that embrace more or less of this lowland. At present it is valued chiefly for the timber, and prices per acre range from $2 or $3 to $15 or $20.

All of the streams in this county from the largest creeks to branches but a mile or so in length, are bordered by a strip of nearly flat land whose surface is frequently overflowed and whose subsoil is almost constantly saturated. It is invariably covered with trees and bushes, so that the term Meadow is somewhat misleading. The use of the name in this connection, however, is consistent with the practice in other areas where similar conditions prevail along the streams.

Along the small drainage lines the Meadow is usually a black mucky sand, with a subsoil in which there is generally considerable clay. The presence of Muck is in itself an indication of almost constant wetness. In other places the soil is a dark sandy loam of normal structure, and needs but surface drainage to render it tillable.

On the larger creeks the soils are generally heavier than along the small branches. The silty loams and heavy clays will be found more durable than the black mucky soils overlying sand, in case any of this land is reclaimed by drainage. The latter areas will revert with cultivation to light-colored sandy soils, while the former will improve with use and be found well adapted to corn and grass. Some difficulty may be experienced in effectually draining certain areas of the heavy soils where the subsoil is a light-colored silt loam somewhat resembling putty. Such material holds water most tenaciously and unless it contains considerable sand it will not respond well either to open ditch or to tile drains.

The straightening of the stream channels would in many cases lower the average height of the ground water sufficiently to encourage the growth of pasture grasses. To cut off the seepage from the adjoining hillsides ditches along the outer margin would be necessary.

The Meadow on Richland and Buck Horn Creeks resembles the alluvium on Pea River, but the surface is more generally wet and swampy. On the streams in the southern part of the county black mucky soils and small areas of Muck are of very common occurrence.

On the small branches the timber consists largely of black gum, water oak, and less valuable kinds of deciduous trees, with some large spruce and swamp pine. The undergrowth of briers, alder bush, and vines is so dense that the pasturage is generally poor or limited to the outer margins, where coarse grasses and cane are more abundant.

On the heavier soils composing the Meadow along the larger creeks white oak and large specimens of other hardwoods are common, with sycamore, beech, birch, poplar, and some ash and hickory. The largest cypress has generally been cut, as well as the best of the pine and white oak. Much of the timber now remaining in the county is found on this low land.

SUMMARY.

Pike County is located in the southeast part of Alabama, and has an area of 675 square miles, or 432,000 acres.

Most of the surface is rolling to hilly, with rather broken areas occurring in the northern, and also in the southwestern parts. The relief is about 200 feet.

The Conecuh Valley crosses the area from northeast to southwest and the terraces and slopes on the west side of it are of much smoother topography than the uplands in general. The same is also true of the Pea River Valley.

The greater part of the upland is cleared and cultivated. The hilly stony lands and also the limited areas of deep sands are rather thinly forested, but the overflow lands are usually densely covered with mixed pine and deciduous woods.

The population is 32,815, of which all but about 6,000 is rural. The ratio of white to colored is about 5 to 3. Troy is the county seat and chief business center.

The price of land ranges from $2 to $3 an acre for the roughest uncleared land to more than $50 for desirably located and well-improved farms. Rent is usually paid in lint cotton, so many bales to the "plow," according to character of ground, the best commanding about 3 bales. Farm labor, mostly colored, is usually abundant and commands an equivalent of about $1 a day.

The climate is mild and healthful. The average rainfall is about 60 inches. The mean temperature for the winter months is 49° F.,

for the summer, 81° F. The length of season between killing frosts is about eight months.

Cotton is the principal crop. On many of the larger estates it is almost the only product, but on the smaller farms, operated by the owners, more diversified farming is generally practiced. The total production in recent years has ranged from 27,000 to 43,000 bales. The yields per acre are variable, from less than one-fourth bale on poorer soils to more than a bale on well-tilled soils of good character.

Corn ranks next to cotton, and increased attention is being given to its production.

The planting of cowpeas or peanuts between the rows of corn is a very common practice. Most of the forage for work animals is obtained by "pulling" fodder, or leaves, from cornstalks. Sorghum cowpeas, millet, and crab grass are used for forage or hay.

Sugar cane, watermelons, and sweet potatoes are raised for the local market, but little attention is given to truck or small fruits. Peaches, plums, figs, grapes, and also apples do well.

Commercial fertilizers are in general use and are the chief dependence in maintaining crop yields.

The soils in the northern part of the county are derived chiefly from deposits of Cretaceous age. In the southern half Tertiary formations have contributed most of the soil-making materials. With some exceptions the superficial deposits have suffered such profound changes in weathering that the original characteristics have been greatly modified. Most of the surface soils are highly siliceous and low in lime and other more easily soluble constituents. These conditions are not quite so marked in most of the subsoils. The prevailing colors, red and reddish-yellow, are due to high oxidation of the iron content. The recent alluvial deposits and soils immediately derived from limerock are exceptions.

The Greenville types are deep, dark-red, highly ferruginous soils. The coarse sandy loam and sandy loam are excellent general farming lands, while most of the coarse sand is somewhat inferior in value.

The Orangeburg soils form the red lands of somewhat lighter color. A coarse sand, sand, fine sand, sandy loam, and fine sandy loam occur. The sandy loam has an extensive distribution in the central part of the county and the somewhat heavier fine sandy loam occurs chiefly in the south-central townships. The two soils last mentioned have a high agricultural value. The sands, considering the class, are fairly well adapted to cultivation.

The Susquehanna clay and fine sandy loam, on account of their unfavorable structural properties, give only low average yields of the general farm crops. Small areas are influenced by calcareous material.

The Susquehanna stony sandy loam covers some very broken land where the surface is stony and gravelly. The sandy loam is less ferruginous and usually has a very heavy clay subsoil.

The light-colored quartz sands of common occurrence throughout the uplands have all been included in the Norfolk series. A coarse sand, sand, fine sand, coarse sandy loam, sandy loam, and fine sandy loam of this series are found. The lighter types are better for truck growing; the heavier give very good yields of the staples suited to the region.

The Ruston sandy loam has a rather extensive development in the northern part of the area. In color, topography, and agricultural value it lies between the Norfolk sandy loam and rougher phases of the Orangeburg sandy loam.

The Cahaba types occur on the high terraces of the Conecuh and Pea Rivers. They are nearly level and afford areas of good farm land, but are too sandy to be strong soils.

The Kalmia fine sandy loam is found on the low second bottoms. It is the local "hammock land" and while not always well drained, is a desirable type.

The Ocklocknee types, where differentiated, embrace those alluvial soils that are only occasionally overflowed, or where the surface conditions would admit of their cultivation with comparatively little artificial drainage. The flood plains of the Conecuh and Pea Rivers afford the largest areas of this kind, but smaller developments occur on the creeks. Where these recent deposits are generally swampy they have been mapped as Meadow. When reclaimed the Meadow areas will become types of the Ocklocknee series.

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