U. S. DEPARTMENT OF AGRICULTURE,

BUREAU OF SOILS—MILTON WHITNEY, Chief.

IN COOPERATION WITH THE STATE OF ALABAMA, EMMETT O'NEAL, GOVERNOR;
REUBEN F. KOLB, COMMISSIONER AGRICULTURE AND INDUSTRIES;
EUGENE A. SMITH, STATE GEOLOGIST.

SOIL SURVEY OF BARBOUR COUNTY, ALABAMA.

BY

HOWARD C. SMITH, OF THE U. S. DEPARTMENT OF AGRICULTURE, IN CHARGE, AND N. ERIC BELL AND J. F. STROUD, OF THE ALABAMA DEPARTMENT OF AGRICULTURE AND INDUSTRIES.

W. EDWARD HEARN, INSPECTOR, SOUTHERN DIVISION.

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

WASHINGTON:
GOVERNMENT PRINTING OFFICE,
1916

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LETTER OF TRANSMITTAL.

U. S. DEPARTMENT OF AGRICULTURE,
BUREAU OF SOILS,
Washington, D. C., March 29, 1916.

SIR: Under the cooperative agreement with the State of Alabama a soil survey of Barbour County was carried to completion during the field season of 1914.

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

Respectfully,

MILTON WHITNEY,
Chief of Bureau.

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

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SOIL SURVEY OF BARBOUR COUNTY, ALABAMA.

By HOWARD C. SMITH, of the U. S. Department of Agriculture, In Charge, and N. ERIC BELL and J. F. STROUD, of the Alabama Department of Agriculture and Industries.

DESCRIPTION OF THE AREA.

Barbour County lies in the southeastern part of Alabama, about 50 miles north of the Florida line. It is bounded by Bullock and Russell Counties on the north, Henry and Dale Counties on the south, and Pike and Bullock Counties on the west. On the east the Chattahoochee River separates Barbour County from the State of Georgia, and on the west Pea River forms a natural boundary. In outline the county is very irregular. The maximum dimensions are about 32 miles east and west and 36 miles north and south. The county comprises an area of 906 square miles, or 579,840 acres.

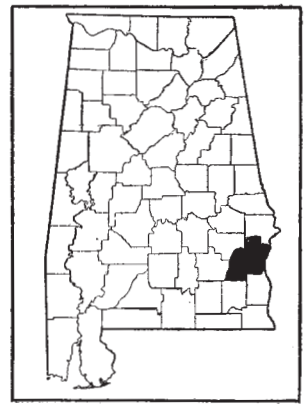

FIG. 1.—Sketch map showing location of the Barbour County area, Alabama.

Barbour County lies on the remnants of a southward sloping plain. In the northern part erosion has progressed so far that the ancient plain surface has completely disappeared and in its place is a rolling to hilly surface, all of which lies lower than the ancient surface, though occasional hilltops rise approximately to its former level. The wasting away of the northern part has been effected by the lateral or tributary streams of the Chattahoochee River, their headwaters reaching entirely across the northern portion of the county. These streams have reduced this part of the county to a rolling or undulating country, its comparative smoothness being due to the advanced stage of degradation reached.

South of this area there is an elongated belt of rough country extending through Rs. 26, 27, and 28 and including the southern part of T. 12 and a portion of T. 11 to the south of it. This belt should be regarded as extending southeastward, with a width extending from the heads of the Chattahoochee drainage eastward to within

5 to 7 miles of the Chattahoochee River. East of this lies a rolling country that is continuous with, and the same in origin as, the rolling land in the northern part of the county.

An outlying portion of the belt just described, including an area of about 9 square miles between Chewalla Creek and the South Fork of Cowikee Creek, is exceptionally rough. It is called locally "The Mountains," and comprises the roughest land in the county.

West and south of the curving, rough belt lies a triangular area of the ancient plain, dissected by streams, but not yet subjected to the destructive erosion which the northern and eastern parts of the county have suffered. It includes practically the whole of the county, except the belts heretofore mentioned. Along its western side the Pea River has cut a valley of moderate width, and its eastern drainage has reduced a relatively narrow belt to a condition that approximates that of the rough belt of the Chattahooche tributary headwaters on its eastern side. The surface of the plain is dissected by a number of more or less parallel southward flowing streams into a series of north-south watershed ridges, all of which lie at about the same level. All these are narrow. The broadest are the ridges between Pea River and the West Fork Choctawhatchee River and that between the Chattahoochee drainage and East Fork Choctawhatchee River. The latter is followed approximately by the Indian boundary line.

The highest points on this plain are on its northern end about 6 miles north of Clayton, where an elevation of 665 feet above sea level is reached. The elevation of Clayton is 589 feet and of Clio 534 feet. Eufaula lies at 255 feet and Lugo at 363 feet.

An important physiographic feature of the Chattahoochee Valley is the terraces formed as bottom lands when the river flowed at a much higher level than at present. The highest of these terraces lie 140 feet above the river. Terraces occur along the larger creeks as well as along the river. The terraces are invariably broad in proportion to the present first bottoms. Along the Chattahoochee they range from one-fourth mile to 3½ miles in width, averaging about 2 miles. The ascent from the first bottoms to the first terrace may be a steep bluff 50 to 100 feet high, as at Eufaula and several other places on the river. The first terrace is level to very gently undulating and almost entirely arable. The second terrace is higher and less extensive than the first. Where it is most eroded it closely resembles the smoother areas of the uplands and is not in all cases readily distinguishable from the latter. Remnants of a former third and fourth terrace exist, there being little save elevation to distinguish them from the contiguous eroded upland, and the soils here, together with

those on the most eroded portions of the second terrace, are mapped as upland soils.

The early settlers in Barbour County were of Scotch, English, and Irish descent. They came largely from the States to the east. A large proportion of the whites are descendants of these first settlers. Over half the population is negro. The census reports show a steady increase of population until 1900. In that year it amounted to 35,152, as compared with 33,979 in 1880. In 1910, however, it had decreased to 32,728, of which 87 per cent, or about 2 per cent less than in 1880, was rural. The density of the rural population is 31.2 persons to the square mile. Only a small part of the county is thickly settled, and there are many valuable tracts of cheap uncleared land awaiting development. About half the white people live on farms, and a large proportion of the white farmers live in the southern half of the county. Where the tenant system prevails, as in the sections around White Oak, Knowlton, and Comer, the colored population is greatest.

Eufaula, Clayton, and Clio are the three largest towns in the county, with populations of 4,259, 1,130, and 580, respectively. Clio doubled in population between the last two census years.

Two lines of the Central of Georgia Railway serve the county. A through line traverses the northern part, affording ready communication with Atlanta, Birmingham, Montgomery, and New Orleans. Eufaula, Lugo, Batesville, Fairmount, and Comer are shipping points on this line. The Eufaula and Ozark division runs west from Eufaula. Eufaula, Clayton, and Clio are the principal points on this branch.

Besides the service offered by the railroad, transportation is afforded by the Chattahoochee River. There are several steamboat landings in the county, which are used by boats maintaining a regular schedule. River transportation is especially valuable to the southeastern part of the county, which is remote from a railroad.

Some of the main wagon roads have been graded and surfaced. Unimproved roads in the clayey regions are heavy in winter but good in dry weather. In the deep Norfolk sands the roads are heavy at all seasons of the year. The development of some desirable farming land in the more remote sections has been retarded by a lack of good roads.

The industries of Barbour County are almost exclusively agricultural. A cotton mill is located at Eufaula, and there are 88 gins in the county. Some of these are combined with feed and saw mills. The turpentine industry is of some importance in the southern part of the county, and there are numerous sawmills in operation.

Telephone service is well developed in the southern part of the county, and the rural delivery of mail reaches practically all parts of the county.

CLIMATE.

The climate of Barbour County is equable, with few extremes. The summers are long, with a large percentage of sunshiny days, and the winters are mild. The average dates of the last killing frost in the spring and the first in the fall are March 14 and November 9, respectively, at Eufaula, in the Chattahoochee Valley. The latest and earliest frosts recorded here occurred April 1 and October 25. The summer weather is occasionally oppressive. The highest temperature recorded is 104° F., reached in July. The lowest temperature, —4° F., occurred in February. On account of the large size of the county and its range in topography and elevation there are considerable local differences in temperature and in the occurrence of frosts.

The mean annual precipitation at Eufaula is 52.25 inches. There are normally two periods of rainy weather—in midwinter and midsummer. Twenty-five-year records at Eufaula show an average of 102 days in the year with 0.01 inch or more precipitation. The rainfall is ample for all the common crops.

Supplies of water for domestic use are abundant. In the sandy-land regions recourse is had to dug wells, ranging from 10 to 80 feet in depth. In the limestone sections the wells are drilled several hundred feet through the lime strata and very good water is obtained. There are several flowing wells at Comer and in the Cowikee Valley. Except in the region of clayey soils in the northern part of the county springs are numerous on every type of soil. Among the most widely known of these springs is the one at Blue Springs. This is a health resort and the spring is said to be the largest in southern Alabama.

The following table, compiled from the records of the Weather Bureau station at Eufaula, gives the essential features of the climate of the county:

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

Month.	Temperature.			Precipitation.		
	Mean.	Absolute maximum.	Absolute minimum.	Mean.	Total amount for the driest year.	Total amount for the wettest year.
	° *F.*	° *F.*	° *F.*	*Inches.*	*Inches.*	*Inches.*
December	48.3	82	10	4.60	5.02	4.46
January	46.3	81	12	4.33	5.07	6.02
February	49.0	81	− 4	6.33	9.15	5.08
Winter	47.9	82	− 4	15.26	19.24	15.56
March	59.0	89	20	6.31	2.73	7.86
April	64.5	92	30	3.10	1.88	11.25
May	73.1	101	41	3.35	1.37	2.62
Spring	65.5	101	20	12.76	5.98	21.73
June	78.9	101	52	3.56	1.84	5.18
July	80.6	104	56	6.19	2.87	2.87
August	80.0	103	61	5.63	7.79	10.06
Summer	79.8	104	52	15.38	12.50	18.11
September	75.9	100	39	3.52	1.31	5.00
October	64.9	94	23	2.44	.10	5.84
November	55.7	83	10	2.89	2.81	3.38
Fall	65.5	100	10	8.85	4.22	14.22
Year	64.7	104	− 4	52.25	41.94	69.62

AGRICULTURE.

Agriculture in Barbour County began in 1832 and was for a long time mainly of the self-sustaining type. The Greenville, Orangeburg, and Ruston soils, the "oak-and-hickory" lands, were largely settled at first. The "sandy hammocks," and "piney-woods" soils, mapped as the Kalmia, Cahaba, Leaf, and Chattahoochee series, and the deep sands of the Norfolk series, were taken up later. The extreme northern, western, and southern parts of the county were the last to be settled. For many years the impression prevailed that these regions, largely piney-woods land, were unfit for farming. This land in the vicinity of Blue Springs and Clio now embraces some of the best farms in the county.

The early methods of agriculture were wasteful. Land was cropped until the yields declined, when it was allowed to revert to forest, and fresh land cleared. The success of this early agriculture was made possible by the abundance of cheap lands, cheap labor, and by the home production of necessities.

The relative importance of the various crops has changed but slightly in the last 40 years. In 1879 cotton occupied 100,442 acres, producing 26,063 bales. Corn was second in acreage, being planted on 61,822 acres, and producing 437,415 bushels. Oats was the third crop, 10,264 acres being in this cereal. The other crops at this period, among which sweet potatoes and sugar cane led, were subordinate. During the following decade farming conditions changed very little. The corn acreage had increased to 78,366 acres by 1899, with a production of 613,518 bushels. Cotton showed a smaller acreage than in 1889, 98,743 acres, as compared with 104,738, and a reduced production, 29,395 bales, as compared with 33,440 bales in 1889. In 1899 oats occupied only 2,267 acres, cowpeas were planted on 4,164 acres, and peanuts on 3,238 acres. All other crops were unimportant.

In 1909 cotton showed almost the same acreage and production as 10 years before. The crop amounted to 28,453 bales, from 99,170 acres, or somewhat more than one-fourth bale per acre. Corn occupied a smaller acreage than in 1899, 71,718 acres, but the production that year was almost as large as in 1899. Oats occupied 3,250 acres, peanuts 2,853 acres, cowpeas 1,383 acres, sweet potatoes 1,184 acres, and sugar cane 953 acres. Other crops were very subordinate, with the exception of hay, which, including grains cut green and coarse forage, was cut from 1,425 acres.

Barbour County ranks among the leading cotton-producing counties of Alabama. The average annual production for the last 10 years is 29,342 bales. The crop in 1914 amounted to 41,000 bales, the largest ever produced. The average yield per acre for 30 years is 142 pounds of lint cotton per acre. The average yield reported by 29 farmers practicing better methods of cultivation than is general, is 207 pounds per acre. Seventy-seven of eighty farmers questioned during the soil survey reported a gradual increase in yield. Negro and tenant farmers generally reported no change in yield or a decrease. The cotton crop is disposed of readily. The storage facilities are ample.

There is not a widespread recognition of the adaptation of certain varieties of cotton to different soil types. The strain most popular is Sam Woods Blightless. Other varieties grown are the Russell Big Boll, Covington Toole, Cleveland Big Boll, and Christopher. The popularity of the Blightless is due in large part to the general tendency of many cottons to blight on the sandy lands. Farmers believe that the Blightless is best suited to "run-down" or impoverished lands, such as the deep sands, and that the Russell Big Boll and in a general way the other big-boll varieties do best on fresh land or soil in a high state of productiveness.

On most of the soils fertilization is necessary for profitable yields. Fertilizers containing 10 per cent phosphoric acid, 2 per cent ni-

trogen, and 2 per cent potash are commonly used by tenant farmers. Mixtures analyzing 8–3–4 are popular with landowners. Acreage applications range from 300 to 600 pounds per acre. Commonly, half the fertilizer is applied 10 to 14 days before planting and the remainder at the time of planting. When the crop is "laid by" a side dressing of potash or nitrate of soda is often applied.

The advent of the boll weevil has caused great changes in cotton culture. Aside from the selection of an early-maturing variety, defensive measures against the weevil consist largely of treatment of the soil. Early maturity is induced by choosing well-drained soils in preference to low-lying lands which are cold and wet; by thorough preliminary preparation of the soil and early planting; by careful fertilization designed to hasten growth; and by frequent tillage in order to conserve a dust mulch and kill as many weevils as possible by covering. In parts of Texas, Mississippi, and Alabama it has been found that less damage is done by the weevil on deep sands and sandy loams, but even on these soils success depends largely upon the ability to ripen the crop before the weevil multiplies to a dangerous extent.

Corn has always been the crop of secondary importance in Barbour County. In 1909, 71,718 acres produced 612,794 bushels. Eight and one-half bushels per acre is about the average yield for the county. It is estimated that the annual imports of corn and corn products have a value of $200,000. Were the average yield increased to 11 bushels per acre it would not be necessary to import any corn. A great majority of the farmers questioned during the survey reported an increase in yields over previous years, made possible by the use of improved seed, more thorough fertilization, deeper plowing, and rotation of crops. The soil and climatic conditions are well suited to corn. The average yield obtained by three contestants in a boys' corn club contest in 1912 was 98.31 bushels per acre.

The variety of corn most commonly grown is Hastings Prolific, with Hickory King and Marlboro of less importance. Nondescript varieties are common. Importations of improved seed are made annually.

Less fertilizer is used on corn than on cotton. Manure composted with cotton seed is commonly applied where it is impracticable to haul commercial fertilizers. Side applications of nitrate of soda are generally reported to give good results. In the very wet year of 1912 and the dry year of 1914 the use of nitrate was unprofitable in nearly every instance.

Oats have been decreasing in acreage in Barbour County until the present year (1914), when the general diversification of crops resulted in the largest acreage ever sowed. Texas Red Rustproof is the most popular variety, although many farmers sow the Bancroft,

Hastings or Fulghum. There are many soils of the county admirably suited to oats and the grain fits well into rotations having for their object the improvement of the soil and the production of foodstuffs and feeds.

Rye is successfully grown on many farms, but in a small way. It does well on all the well-drained soils, especially those of heavier texture. This grain gives winter pasturage and makes a good cover crop.

Prior to the Civil War wheat was a common crop. Profitable yields were obtained on the Susquehanna clay and other soils of heavy texture. It has not been produced in recent years.

Enough sugar cane is grown to supply sirup for home use, and a few growers have marketed a surplus in near-by cities. Yields of 200 to 300 gallons per acre are common. The average yield is about 150 gallons per acre. Barbour County is well within the climatic limit of commercial sugar-cane production and has a large development of soils that produce the highest grade of table sirup. Sorghum is also grown for sirup, mostly in the northern part of the county. This crop can be grown as well for forage, and the range of soils to which it is suited is wide.

The extensive areas of sands and sandy loams in Barbour County are well suited to a large number of early to medium-early vegetables, and the heavier types to late vegetables. The light soils of the Ruston, Cahaba, Norfolk, Orangeburg, Kalmia, and Chattahoochee series are the best early vegetable types. The heavier soils are well suited to fibrous-rooted crops, such as cabbage, cauliflower, collards, tomatoes, strawberries, kale, spinach, and lettuce. The tuberous crops, including turnips, beets, radishes, potatoes, and sweet potatoes, need a lighter textured soil for good development. There is considerable inducement for the extension of the trucking and fruit-growing industries. The mild climate permits a successive growth of vegetables throughout the year. Collards, winter cabbage, beets, turnips, radishes, lettuce, and parsnips grow during the winter with protection on frosty nights. Watermelons are a common crop. The demand is active in July and August. The local production is adequate and small quantities are occasionally shipped to outside markets. Peaches, tomatoes, and sweet potatoes are canned for home use and find a ready local sale.

Irish potatoes are grown as a garden vegetable on nearly every farm. Two crops can be produced annually if the first planting is from northern-grown seed. No effort is made to supply the demands of local markets, although present prices are attractive, and there is inducement for the extension of potato growing.

The census of 1910 reports the production of sweet potatoes as 86,722 bushels, equivalent to 2.61 bushels per capita. The yields on

well-fertilized soils range from 100 to 200 bushels per acre, and the price obtained varies from 50 cents to $1 a bushel.

The hay crops are comparatively unimportant in Barbour County, although there are many legumes, grasses, and forage crops that can be grown for this purpose. Johnson grass does well on the Houston and Susquehanna clays, and furnishes two cuttings, averaging 1 ton each. Bermuda grass makes better pasture than any other grass, and does well on almost all the soils. Crab and crowfoot grasses are volunteer growths in fields. Yields of hay are ordinarily three-fourths ton per acre. Carpet grass (*Paspalum compressum*) grows on all the moist soils in the northern part of the county, where it is a valuable pasture grass. The large water grass (*Paspalum dilatatum*) grows on the Houston and Susquehanna clays. It is not used as a hay crop, but has some value as pasturage. Broom sedge is widely distributed. In Barbour County it is held in low esteem for hay or pasturage.

A plant of wide distribution on the sandy soils in the southern part of the county is "Mexican clover" or "Florida purslane" (*Richarida scabra*). This plant is neither a legume nor a grass. It furnishes a fair quality of hay for work stock, and often yields three-fourths to 1 ton per acre. It has some value as a source of organic matter.

Alfalfa has been successfully produced in an experimental way. Where drainage is good and the soil well limed and inoculated alfalfa can be grown on several of the soils of the county. The Houston soils are well suited to it. The Ruston, Greenville, Orangeburg, and Susquehanna soils are not well suited to its commercial production. Early spring rains make the curing of the first crop difficult.

Cowpeas are a common crop in the southern part of the county. They are grown for hay following June-cut oats or as an intertillage crop. They succeed well on all except the wet, undrained soils. The Iron cowpea is wilt resistant, and its culture is advisable on all soils which, on account of their sandy nature, favor the spread of the disease. The wilt also attacks cotton. Soy beans are a good substitute for cowpeas where the wilt is prevalent. The crop is well adapted to the sandy hammock lands.

Peanuts are grown in the southern tier of townships to improve the soil, for forage, for hog pasture, and for market. On the light sandy soils there is no other crop at present grown that yields as much forage and feed.

The velvet bean is also grown in the southern part of the county, where it is extensively planted in corn. This legume succeeds on the well-drained uplands and markedly improves the soil. The crop in many cases is sold for seed. The vines are pastured during the winter. The beans and vines are valuable for hog and cattle feed.

Besides these cultivated legumes there are several wild species of more or less value as grazing or hay crops. Among them lespedeza (Japan clover) is probably the most important. On the calcareous types melilotus is a characteristic plant, while some wild vetches thrive on the sandy soils.

Only a small part of the farm income in Barbour County is derived from fruit products. The value of fruit and nut products in 1909 is reported as $9,269. The census reports 38,434 fruit and nut trees, among which the peach predominates, with apple, pecan, pear, and fig following in the order named.

The commercial production of peaches has been largely abandoned, to some extent on account of the brown rot and San Jose scale, enemies readily controllable by spraying. The Elberta, Belle, Carman, and Mayflower are varieties that succeed here. There are large areas of Orangeburg and other soils well suited to peach orcharding. In Bullock County, to the north, the largest commercial orchard in the South is located on the Norfolk sand, which is extensive in Barbour County.

Barbour County ranks fifth in the State in the number of pecan trees. The propagation of budded stock on the Kalmia soils near Eufaula, and on the Greenville sandy loam at Clayton has become an established industry. Among the leading varieties are the Georgia, Van Deman, Stuart, and Frotscher. Pecan groves in the county are located on the Norfolk sand, the Susquehanna fine sandy loam, and some calcareous soils. Two carloads of nuts were sold in 1914.

The live-stock industries of Barbour County have changed little within the last three or four decades. The 1880 census reports almost the same number of domestic animals as that of 1910. More than a third of the 13,607 cattle enumerated in the latter year are dairy cows, and the value of the dairy products for 1909 was $65,796. Hogs and poultry are found on every farm and 13,356 hogs were slaughtered or sold in 1909.

The live stock is generally of inferior grade and is poorly cared for, especially during the winter months. The cattle tick tends to discourage cattle raising, but the tendency toward a greater diversity in agriculture is creating more interest in the possibilities of live-stock production. The abundance of pasturage and feed crops and other factors are favorable to stock raising. A large part of the dairy and beef products consumed locally is produced in the county.

Most of the work animals in the county are mules. The 1910 census reports 4,612 mules and only 925 horses. Sheep were at one time important, but flocks are not common at present.

Commercial fertilizers are extensively used in Barbour County, the expenditure in 1909 for this purpose being $220,715, or about $61 per farm reporting outlay. The fertilizers are mainly complete mix-

tures of low grade. The best farmers usually supplement 10–2–2 mixtures with manure, cottonseed meal or nitrogen in some form. The use of better grades is increasing, 8–3–4 mixtures being employed on some farms. The home mixing of all or a part of the fertilizers used is a common practice. Lot manure, either pulverized and drilled or broadcasted, is commonly applied to corn land, but the supply of animal manure is inadequate.

Many of the soils of Barbour County, including all the red soils, are either in an acid condition or low in lime. Aside from the Houston clay and some of the overflowed bottom lands, it is probable that every type would be more or less benefited by liming. The entire area of the county is underlain by lime-bearing formations, and the material could be applied either raw or burned in kilns on the farm.[1]

Systematic crop rotations are not generally employed in Barbour County. A practical three-year rotation for many closely supervised farms consists of corn or cotton every other year, with a year intervening of oats or vetch, sowed singly or together, or rye, rape, and crimson clover mixed. These crops may be pastured, or cut for hay in June and a crop of cowpeas sowed; when these are harvested in the fall they are best followed by some winter cover crop.

The local demand for farm crops, dairy and poultry products, truck, and fruit exceeds the supply and many thousands of dollars' worth of products easily and cheaply raised at home are annually imported. Although there is no large city population, the possibilities of developing a home market for more of practically all the farm products are excellent. Produce may be sent by express to the large cities of Montgomery, Atlanta, and Birmingham in 24 hours or less and to seaports in 2 days.

In 1880 there were 3,110 farms[2] in the county, of an average size of 165 acres; 50.3 per cent of the farms were operated by tenants. In 1910 there were 4,606 farms, averaging 92 acres in size, while the percentage of tenants reached 71.8. The same authority shows 4,413 farm homes, of which less than one-fifth are owned by the occupants. Land holdings range from 6,000 acres or more to small "one-mule" farms of 25 to 35 acres. The holdings are larger in the northern and north-central parts of the county.

There are several general systems of leasing farm land. Under one the owner receives from 2 to 2½ bales of cotton for a "one-mule" farm. Under another the owner furnishes work stock, seed, tools, and half the fertilizer, and defrays half the expense of baling the crop, and receives one-half the product.

[1] The hardest Clayton limestone outcropping near Clayton analyzes over 75 per cent lime. The soft, chalky Ripley formation ranges in lime content from 38 to 55 per cent.

[2] The census tabulates each tenancy as a "farm."

Negroes form the greater number of the farm hands. The average wage is $10 to $12 a month, with cabin, fuel, garden plot, a stipulated quantity of provisions, and often pasturage for a cow. In cotton-chopping season men receive 75 cents to $1 a day and women 50 to 60 cents a day. Cotton pickers receive 50 to 60 cents a hundredweight. The colored labor is largely unskilled, but, owing to the distance from industrial centers, the supply is quite dependable.

SOILS.

Barbour County is included in the Coastal Plain soil province, and the materials from which the soils are derived, are water deposited. According to their origin, the soils fall naturally into four main divisions: Upland soils derived from the decomposition of old lime-bearing rocks; upland soils derived from unconsolidated sandy deposits, in most places influenced by noncalcareous, but in some places by limestone, material; the stream-terrace soils, lying above normal overflow and consisting of old alluvium; and first-bottom soils, overflowed frequently and still in process of formation and change.

The various soil types have resulted from the weathering of these various original deposits, which has brought about differences in elevation, topography, drainage, texture, and color. Soils similar in origin and other characteristics than texture are grouped into series, the units of which, the types, are differentiated on the basis of texture, or the relative proportion of the different grades of soil particles, such as sand, silt, and clay, contained. The soils mapped in Barbour County are correlated with types previously encountered in other surveys by the Bureau of Soils. In all, soils of 13 series, embracing 24 types and several phases, in addition to Meadow, are mapped in this survey.

The soils derived from calcareous material are recognized as the Houston and Susquehanna clays. The Houston clay is a type of dark-gray or black surface soil, occurring where drainage is good. The Susquehanna clay occurs in close association with the Houston and overlies marl. It is therefore probable that at least part of this soil is derived from these calcareous rocks. Thorough leaching has removed the lime.

A noncalcareous mantle of sands (largely grayish) and reddish, friable sandy clays originally overlay the lime-bearing formations, but it has in many cases been entirely removed by long-continued erosion. This sandy mantle upon weathering gives rise to the Norfolk, Orangeburg, Ruston, and Greenville soils. These types form the highest land in the county.

Where the material is brownish or red the soil is classed with the Greenville series, and where gray with the Norfolk, Orangeburg,

Ruston or Susquehanna series. The Susquehanna is distinguished from the other gray soils by its plastic subsoil. The Norfolk occurs where the subsoil is yellow. The Orangeburg series has a red subsoil of open-structured, friable sandy clay. The Ruston subsoils are yellowish red, and moderately friable.

The Houston series is developed where underlying calcareous formations have given rise to the soil. Only one type is mapped in this county. An Oktibbeha soil is developed in this county in one small area, mapped with the Susquehanna clay, but distinguished by inclusion symbols.

The degree of redness or other color of the soil and subsoil of these several series depends largely on drainage, permeability of the material, vegetal covering and accumulation, and upon erosion. Good drainage and aeration conduce to oxidation of the iron compounds, resulting in brighter, more uniform colors; poor drainage and lack of aeration give grayish and mottled colors.

With the exception of the Houston clay, every upland soil carries quartz sand in quantities varying from a low percentage in the Susquehanna clay to 90 per cent or more in the Norfolk sands. Another common feature is the presence of iron-cemented aggregates or flattish iron concretions. With the exception of the Houston and Oktibbeha clays, and a small part of the Susquehanna clay, all the soils are deficient in lime. The upland types are usually low in organic matter.

The terrace or second-bottom soils comprise the Chattahoochee, Cahaba, Kalmia, and Leaf series. The terrace soils represent alluvial material deposited by the streams as flood plains when they flowed at a higher level than at present. Along some of the smaller streams the alluvial material has been more or less modified by colluvial material washed from adjacent uplands. The Kalmia and Cahaba soils differ in that the former has poorer drainage and consequently less well oxidized subsoils. The Leaf soil resembles the Kalmia in color, but has a heavy, reddish mottled and impervious clayey subsoil. The Chattahoochee type has a gray to brown surface soil underlain by a red subsoil and corresponds in color to the Orangeburg soil of the uplands.

The Chattahoochee River rises in the Piedmont Plateau and the material of its terraces is derived from crystalline and micaceous formations. The soils of these terraces are consequently derived from a wider mineralogical range of material than those along its tributaries. They are better drained and are better farming soils than the terrace soils of the smaller streams.

The Myatt fine sandy loam occupies very poorly drained, flat areas on low terraces. The material resembles the Kalmia. The Myatt

type in this survey is distinguished by inclusion symbol in the Ochlockonee fine sandy loam.

The soil in the first bottoms or flood plains of the streams is recognized as belonging to the Ochlockonee series. The materials giving rise to this series are derived from the upland types.

Meadow includes the alluvial and colluvial material along the smaller streams, which is so variable in texture and color that separation into types on a map of the scale used in this survey is impracticable.

In the following table are shown the name and the actual and relative extent of each type mapped in Barbour County:

Areas of different soils.

Soil.	Acres.	Per cent.	Soil.	Acres.	Per cent.
Ruston sandy loam	123,968	21.3	Kalmia sand	10,560	1.8
Norfolk sand	76,608	14.3	Kalmia fine sand	9,792	1.7
Loamy phase	6,272		Norfolk sandy loam	9,600	1.7
Ruston gravelly sandy loam	57,728	10.0	Norfolk coarse sand	7,872	1.4
Susquehanna clay	37,504	8.4	Susquehanna sandy loam	5,568	1.0
Hilly phase	11,584		Chattahoochee fine sandy loam	5,504	1.0
Greenville sandy loam	37,312	6.4	Greenville loam	2,560	.8
Orangeburg sandy loam	31,360	5.4	Heavy phase	2,048	
Ochlockonee fine sandy loam	29,056	5.0	Ochlockonee clay loam	3,904	.7
Susquehanna fine sandy loam	26,240	4.5	Cahaba fine sandy loam	3,328	.7
Leaf fine sandy loam	25,024	4.3	Heavy phase	512	
Kalmia fine sandy loam	16,256	3.2	Norfolk fine sand	3,328	.6
Deep phase	2,560		Houston clay	832	.1
Meadow	18,688	3.2	Total	579,840	
Ruston fine sandy loam	14,272	2.5			

NORFOLK SERIES.

The surface soils of the Norfolk series are characteristically light gray or grayish yellow. The subsoils are yellow and friable in structure. These soils have been derived from unconsolidated deposits of sands and clays of the Coastal Plain. They occupy nearly level to rolling uplands. The series is represented in Barbour County by four types, the fine sand, coarse sand, sandy loam, and sand, the last with a loamy phase.

NORFOLK COARSE SAND.

The surface soil of the Norfolk coarse sand is a light-gray, coarse, incoherent sand, with an average depth of 5 inches. The subsoil is a pale-yellow, coarse sand, which in places is slightly loamy below 30 inches. Fine quartz gravel is not uncommon in both soil and subsoil, and soft iron concretions are often sparingly scattered over the surface.

This type is inextensive. It occurs in the uplands and in narrow strips on the slopes between the higher and lower terraces of the Chattahoochee River. There is a large area east and northeast of Clayton and another in the vicinity of Pleasant Grove Church.

The topography is rolling to somewhat hilly. Most of the type occupies broad, rolling stream divides, 400 to 600 feet above sea level. Drainage is excessive, but the type does not erode badly owing to its power to absorb the rainfall. The light texture, however, renders the soil droughty.

This is naturally an unproductive soil and for its improvement the incorporation of large quantities of organic matter, by plowing under green manuring crops, and heavy applications of commercial fertilizer are required. The use of coarse, strawy manures is apt to decrease the yields in dry seasons. Under favorable conditions of rainfall and with the liberal use of complete high-grade fertilizers yields of as much as 15 bushels of corn and one-half bale of cotton per acre are obtained. The usual practice has been to allow this land to lie fallow one year out of three.

Forested areas are occupied by a second growth of blackjack and other oak, with scattering trees of shortleaf and longleaf pine. Broom sedge and hop clover form the principal small growth.

Land of the Norfolk coarse sand sells for $5 to $8 an acre.

NORFOLK SAND.

The surface soil of the Norfolk sand is a loose, incoherent, grayish sand from 4 to 6 inches deep. The subsoil is a pale-yellow sand which extends to a depth of 3 feet or more without any noticeable change. Soft iron concretions are common and on slopes fine gravel occurs sparingly. Toward the southern part of the county the subsoil gradually becomes redder and the type grades into the Orangeburg sandy loam. In many places, especially on slopes, a reddish, friable sandy clay is encountered just below the 3-foot section.

The Norfolk sand is the second most extensive type mapped. It occurs throughout the county, occupying gently rolling uplands and broad, level interstream areas. It is found on many streamward slopes. Generally speaking, this type comprises the highest elevations in the county, the altitude above sea level ranging from 300 to slightly over 600 feet. The descent from the plateaulike upland to the stream bottoms is generally abrupt, and many of the slopes are too steep for successful cultivation. The smoothest areas are located in secs. 13, 14, 23, and 24, T. 13, R. 26. The country southeast of Comer is very rough.

Drainage is good to excessive. In the southern half of the county there are numerous lime sinks filled with water, but most of such

low-lying areas have good subterranean drainage and include productive land. Like the other sandy members of the Norfolk series, this is a loose, leachy, droughty soil. Its porous texture allows it to absorb nearly all the rainfall and in wet seasons it becomes waterlogged.

The Norfolk sand is known as "piney-woods" land, because of its original luxuriant growth of longleaf pine. Most of the virgin timber has been cut, and the present forest growth consists of blackjack and scrub oak, shortleaf pine, gum, chestnut, persimmon, and chinquapin, with scattered longleaf pine. Hop clover, sedge grass, Bermuda grass, and lespedeza, with a scattering of other grasses, sedges, and wild legumes, comprise the present undergrowth.

The origin of the different areas of this type varies somewhat. Some areas in the northern part of the county can be traced directly and entirely to the gray sand deposits, while others in the south-central and southern parts of the county may be influenced to some extent by Tertiary limestones. The lower lying areas may be derived from the Ozark sands, although the extent of this formation has not been accurately determined in Barbour County, Notwithstanding the variations that exist in its origin, the soil material itself varies but little from area to area.

Most of the Norfolk sand is cleared and cultivated. Cotton and corn are the principal crops grown. Under favorable seasonal conditions, and with heavy applications of commercial fertilizer, as much as a bale of cotton per acre has been obtained. Ordinarily, with an acreage application of 300 to 500 pounds of fertilizer, the yield is from one-fourth to one-half bale per acre. A side application of 100 pounds of nitrate of soda per acre at "laying-by" time seldom fails to produce a marked increase in yields, except in seasons of too much or too little rainfall, as in 1912 and 1914.[1]

Home-mixed fertilizers are often used. One of the most common mixtures consists of equal parts of phosphoric acid, cottonseed meal, and kainit. Over 30 landowners who have used home mixtures report better results than where the ordinary 10–2–2 fertilizer is used. Cotton normally matures 10 to 15 days earlier on this type than on the moist bottoms or heavy upland clays, and the rapid growth is a great advantage in combating the boll weevil.

This soil is not considered as good for corn as for cotton. The ordinary yield of corn is less than 10 bushels per acre, although as much as 35 bushels has been obtained from early plantings in years of ample rainfall with heavy fertilization.

[1] In 1912 there was about 70 inches of rainfall and in 1914 only 46 inches, the former being the wettest year on record.

Near Comer there are commercial orchards of Elberta peaches on this type.[1] The yields are fair, but the trees lack the size and vigor and the fruit the high color that prevails on the Orangeburg sandy loam. Too little attention is given to pruning and spraying the trees, and to cultivating the soil.

Of the minor crops, such as cowpeas, velvet beans, and peanuts, surprisingly large yields are made. These crops have a very beneficial effect upon the soil, in addition to their value for forage and pasturage. They produce more forage per acre than corn.

The type is rather light for oats, and this crop, as well as rye, is valuable mainly as a winter pasture or cover crop, though occasionally, where fertilizer is applied, good yields of grain are obtained. The application of nitrate of soda in the spring has given good results.

No systematic rotation of crops is in general use on this soil. The type is naturally unproductive, and very low in lime as well as in organic matter. It is, however, a quick, warm soil, easily tilled and responsive to applications of commercial fertilizer and organic matter.

This type sells at $5 to $10 an acre, depending on location and improvements.

Norfolk sand, loamy phase.—The loamy phase of the Norfolk sand, to an average depth of 6 inches, is a gray to very light brownish gray sand. The subsoil is a yellow loamy sand, somewhat coherent when moist. At a depth of 3 to 6 feet a heavy clay substratum is encountered. Soft iron concretions are scattered over the surface.

This phase occurs on the highest uplands, principally south and southeast of Clayton. The topography is that of a broad, level plain whose surface is cut into low, rounded hills and undulations by streams. The drainage is excessive, although the moisture conditions are more favorable than upon the typical soil. Crop failures because of dry weather are unknown, but the yields are often materially reduced in seasons of excessive rainfall, such as that of 1912.

This phase was originally known as " piney woods," and the virgin forest growth consisted almost entirely of longleaf pine. At present forested areas are covered with old-field and longleaf pine and oak, with scattered persimmon, dogwood, chinquapin, and chestnut. The land is largely cleared and under cultivation, and the percentage of waste land is low.

The yields of cotton on this soil are slightly higher than on any of the other sandy soils of the Norfolk series. Corn seldom yields

[1] The largest commercial peach orchard in the South is located on this type in Bullock County, adjoining. See report of soil survey of Bullock County, Field Operations, Bureau of Soils, 1913.

over 10 bushels per acre, even with heavy applications of fertilizer, and the ordinary yield is much less. Land of this phase sells for $8 to $12 an acre.

NORFOLK FINE SAND.

The Norfolk fine sand is similar to the Norfolk sand in all respects save texture. It is of small extent in this county. The largest area lies about 2½ miles north of White Oak, other areas occurring throughout the northern part of the county.

The type has the same general surface features as the other sandy members of the Norfolk series. Drainage is thorough, but the soil appears to withstand drought better than the coarser sands. Most of the farms on this type are in the hands of tenants. The soil does not ordinarily produce as good yields as the other sandy types, which are better tilled.

Systematic crop rotations in which the legumes have a prominent place are needed to increase the productiveness of this soil.

On account of its location, the value of land of this type is a little lower than that of the Norfolk sand.

NORFOLK SANDY LOAM.

The surface soil of the Norfolk sandy loam is a gray sand, grading at 4 or 5 inches into a pale-yellow sand to loamy sand and at 10 to 12 inches into a yellow sandy loam. The subsoil, beginning at about 12 to 14 inches, is a yellow, friable sandy clay. In many areas along the contact with the Norfolk sand the soil is deeper. In places a few small iron concretions are scattered over the surface and small quantities of fine quartz gravel also occur.

The type is distributed over most parts of the county, although its total area is not great. Some of the most extensive areas are located in the vicinity of Johnsons Store and southwest of Eufaula.

The topography ranges from undulating to rolling, the relief being milder than that which prevails in the Ruston series. The areas north of Robertson Mill, in secs. 2, 3, 4, 9, and 10, T. 10, R. 25, and in secs. 35 and 36, T. 11, R. 25, are more rolling or hilly than the greater part of the type.

The drainage is thorough, but because of the nearness of the underlying sandy clay to the surface the type withstands extremely wet or dry seasons better than the other members of the Norfolk series. While erosion is less severe than on the heavier soils of the county, it is necessary to exercise care in cultivation in order to prevent the gradual removal of the soil.

The original forest growth consisted mainly of longleaf pine, although the proportion of deciduous trees was larger than on the deeper sand. At present oak, gum, and longleaf and shortleaf pine

constitute the principal trees. Broom sedge is abundant and a scattered growth of lespedeza and Bermuda grass occurs.

Heavy additions of organic matter and commercial fertilizer are required to insure profitable yields on this soil, although they are less needed than on the deeper sandy soils of this series. The use of stable manure in liberal quantities is less apt to decrease yields in dry seasons on this soil than on the deep sands.

The yields of both cotton and corn average higher on this soil, taking a series of years, than on the deep sandy soils. Watermelons and other truck crops, especially sweet potatoes, as well as the legumes, succeed and their acreage is gradually increasing. Where not too thoroughly drained, this soil produces fair yields of sugar cane, from which sirup of the highest quality is made. Oats do well and are grown as a winter cover crop as well as for feed and forage.

The Norfolk sandy loam is considered equal in agricultural value to the Ruston sandy loam.

Ruston Series.

The surface soils of the Ruston series are gray, ranging to grayish brown. The subsoils are reddish yellow to yellowish red and moderately friable, but in places slightly plastic. The lower subsoils are frequently mottled with shades of rusty brown and streaks of red, gray, and yellow. This series is intermediate between the Orangeburg and Norfolk series in subsoil color, and between the Orangeburg and Norfolk on the one hand and the Susquehanna on the other in point of subsoil structure. All these series are derived from material of similar origin, namely, unconsolidated deposits of the Coastal Plain. The Ruston gravelly sandy loam, sandy loam, and fine sandy loam are mapped in Barbour County.

RUSTON GRAVELLY SANDY LOAM.

The fine earth of the Ruston gravelly sandy loam consists of 6 to 8 inches of grayish loamy sand, grading into a yellow loamy sand, which continues to a depth of 10 to 15 inches. The subsoil is a reddish-yellow to dull-red, rather compact, friable sandy clay, becoming lighter in color with depth. In the lower part of the 3-foot section mottling is general. The surface is strewn with small disklike iron concretions and larger pebbles of ferruginous sandstone. The latter are sometimes so abundant on the steeper slopes as to prevent boring. In places platy, angular pieces of sandstone weighing from 10 to 50 pounds occur in sufficient numbers to hinder plowing. Such areas are shown on the map by stone symbols. The subsoil in places is irregularly interstratified with ferruginous sandstone ranging from 1 inch to several inches in thickness, which effectively retards the absorption and movement of moisture. Included with this type are

patches of soils of the Orangeburg, Norfolk, and Susquehanna series, as well as of the Ruston sandy loam and fine sandy loam.

The Ruston gravelly sandy loam is most extensively developed in the southeastern part of the county and between Clayton and the Pea River.

The topography ranges from rolling to hilly and broken. In the roughest areas the type closely resembles the soil mapped elsewhere in the Coastal Plain region as Guin gravelly sandy loam. There are no areas as rough as the eroded portions of the Susquehanna clay, although as a whole the type is rougher than the soils of the Susquehanna series. The rougher portions consist of an intricate system of "wet-weather" gullies and branches bordered by winding, irregular, sharp-topped ridges. Drainage is excessive; in fact, the type is largely a product of erosion.

Only a small percentage of the type is under cultivation, and many fields once tilled are now abandoned or have reverted to forest. Others are badly gullied and should be seeded to Bermuda grass or reforested. Most of the untilled land is in forest, longleaf pine being the principal growth. In the forests of tall longleaf pine there is little shrubby undergrowth, and a large variety of grasses and sedges flourish. This affords pasturage for eight months in the year.

Crop yields on this type average lower than on the other members of the Ruston series, though in very wet years cotton does better on it than on the Norfolk sand. On the better areas of the type under favorable conditions corn may yield 15 bushels and cotton one-third bale per acre. Ordinarily the yield is 7 or 8 bushels of corn and one-fifth bale of cotton.

For the production of profitable crops large applications of fertilizer, as well as the incorporation of organic matter in the form of stable or green manure, are necessary.

The wide areas of pasture and forest land usually contain patches of bottom land and upland of sufficient size to grow corn and grains for winter feed for stock, of which the type is capable of supporting considerable numbers. Large areas of cut-over land are now held by nonresident owners. The price of land of this type ranges from about $2.50 to $10 an acre.

RUSTON SANDY LOAM.

The soil of the Ruston sandy loam consists of 5 inches of gray sand, underlain by 5 to 10 inches of a yellowish sand or loamy sand, changing in the lower part to a deep-yellow or light-reddish, friable sandy loam. The subsoil is a reddish-yellow to yellowish-red or light-red, friable sandy clay, often mottled in the lower part of the 3-foot profile with shades of red and yellow. In many places, es-

pecially near areas of the Susquehanna fine sandy loam, the subsoil is compact and slightly plastic, such areas representing a gradation toward the Susquehanna sandy loam. Flat, angular fragments of ferruginous sandstone are occasionally noticeable on the slopes where erosion is active, and mica flakes and small, disklike iron concretions are common in the soil and subsoil.

Owing to the wide extent of the type and the nature of the topography, there are many variations in the depth and character of the surface soil, which grades toward the deep Norfolk sand on the one hand and the Susquehanna sandy loam on the other. The subsoil is redder on knolls and near areas of the Greenville, Susquehanna, and Orangeburg soils, and yellower as the Norfolk soils are approached. The type as mapped includes patches of the soils of the series named, as well as of the Ruston gravelly sandy loam.

The Ruston sandy loam has a general distribution over the four southern tiers of townships. The largest and most typical areas lie between Clayton and Texasville. Other extensive areas occur northeast of Lawsons Bridge on the Pea River, east of Bakerhill, and south of Lindsey.

Most of the type occupies broad, moderately rolling uplands, crossed by a comparatively small number of streams flowing in broad, trough-shaped valleys. The areas in T. 10, R. 24, bordering the Pea River, and in T. 11, R. 26, north of Clayton, comprise the hilliest portions of the type.

Drainage is good to excessive. In the southwest fourth of the county, where the type is influenced by the Nanafalia and Clayton formations, there are many lime sinks, most of which, however, owing to the porous substratum, seldom contain water. White Pond, in T. 9, R. 27, and a few other small sinks are the only conspicuous exceptions. The dry sinks are usually more productive than the surrounding land. Erosion, which is active in the hilliest sections, can be prevented in large part by terracing, seeding to soil-binding grasses or reforesting.

Forested areas support oak and longleaf and shortleaf pine, with some chestnut, chinquapin, sassafras, basswood, dogwood, black gum, and persimmon. The pasture growths common on other Ruston types prevail.

There is probably a greater proportion of this type under cultivation than of any other extensive type in the county. The principal crops are cotton and corn and the average yields are believed to be higher than on any other extensive upland type. The high yields are due more to the favorable topography, liberal fertilization, and the improved methods followed by the farmers than to inherent fertility of the soil. In the southern two tiers of townships such soil-

improving crops as velvet beans, peanuts, and beggarweed are generally grown by the better class of farmers. Peanuts are often grown as a separate step in the rotation or between the corn rows. Velvet beans are always sowed on corn land and timed so that their growth is greatest after the maturity of the corn. Beggarweed, which is allowed to mature in the cornfields after the crop is laid by, has, in some instances, increased the ordinary yields of corn from 8 or 10 bushels to 20 or 25 bushels per acre. Usually 100 pounds of 10–2–2 fertilizer is applied to give the corn a quick start. Corn is planted about March 15 and laid by about the 1st of June. Beggarweed, which is self-seeding, springs up in the fields and may be cut for hay about the middle of August. The seed crop is ripe the last of September, the yield being about 5 bushels per acre.

The ordinary yield of cotton is about one-third bale per acre; of corn, 8 to 12 bushels; and of oats, 15 to 20 bushels. Under the best methods of cultivation yields two or three times as large are obtained.

Land values vary greatly, being dependent upon location and topography. The highest prices, $15 to $20 an acre, obtain in the vicinity of Clayton, Texasville, and Clio. In T. 10, R. 24, and northeast of Clayton, the prices are less than half the above figures.

RUSTON FINE SANDY LOAM.

The soil of the Ruston fine sandy loam is a gray to brownish-gray fine sand to loamy fine sand, passing at a depth of about 5 to 15 inches into a yellowish loamy fine sand to fine sandy loam. The subsoil is a yellowish-red to reddish-yellow, friable fine sandy clay. There are often circular mottlings of red, yellow, and gray in the lower part of the 3-foot section, and mica flakes are common. Near Spring Hill, where the type occurs in close association with the plastic Susquehanna soils, the subsoil is a compact clay, rather tough and hard and somewhat plastic. In the region northeast of White Oak, where the type is associated with types having friable subsoils, the subsoil is coarser and less compact than typical, and has less mottling in the lower portion. Small fragments of ferruginous sandstone and flattened, chiplike concretions are not uncommon in the soil of the hillier areas.

The Ruston fine sandy loam is inextensive. Its occurrence is around Wilsonville Church and near Spring Hill. The topography is less rolling than that of the Ruston sandy loam. A large proportion of the type is under cultivation, while the remainder supports a growth of longleaf and shortleaf pine and oak.

The type has practically the same crop adaptation as the Ruston sandy loam, and the yields are about the same as those on the better areas of that type. Owing to its finer texture it seems to withstand

drought better than the sandy loam. The areas of heavier subsoil near Spring Hill resemble the Susquehanna fine sandy loam in surface features. The soil here is retentive of moisture and fertilizer and can be tilled under a wide range of moisture conditions. It is the basis of a flourishing agriculture.

Land of the Ruston fine sandy loam has a slightly higher value than the sandy loam.

Orangeburg Series.

The surface soils of the Orangeburg series are gray, ranging to reddish brown. The subsoils consist of red, friable sandy clay. Both soil and subsoil are open structured and normally well drained. This series is confined to the uplands of the Coastal Plain, being most extensively developed in a belt reaching from southern North Carolina to central Texas. The soils are sedimentary in origin, and, like the Norfolk soils, are derived from unconsolidated sands and clays. One member of this series, the sandy loam, is mapped in Barbour County.

Orangeburg sandy loam.

The surface soil of the Orangeburg sandy loam is a gray to brownish-gray sand, grading into a yellow sand to loamy sand at 4 to 6 inches. This, at a depth of 10 to 15 inches, is underlain by a red, friable, granular sandy clay subsoil. Iron concretions are rather common, and platy fragments are occasionally seen on the surface where erosion is active.

In places the soil contains considerable coarse sand. In the extreme southern part of the county the subsoil is heavier and more compact than to the north, and is slightly plastic. These areas border the Susquehanna sandy loam, and in places the two types resemble each other so closely that it is impossible to draw any distinct line of separation.

On the steep hillsides there are marked variations from the typical soil in texture, structure, and color, caused by erosion. In the lower subsoil, at depths of 4 to 6 feet, the color changes to yellow or mottled yellow and gray, and ferruginous sandstone strata are quite common. On the steeper slopes they are prominent surface features. Near the Henry County line there are a few small spots where the subsoil is a reddish sand or light sandy loam. Such material would have been mapped as Orangeburg sand had it been sufficiently extensive. The only large area is in secs. 15 and 22, T. 8, R. 26.

The Orangeburg sandy loam in this county is derived to some extent from limestone, as is evident from the Tertiary shells[1] found therein.

[1] Identified by Dr. E. A. Smith, State geologist.

The Orangeburg sandy loam occurs in scattered areas, the largest being located near Bakerhill, around Texasville, on the Henry County line, in the northern part of the county around Spring Hill, and west of Clayton in secs. 22, 26, 27, 34, and 35, T. 11, R. 25. This last-named area represents the typical soil, while that around Texasville is representative of the heavier and more compact variation.

The topography of the Orangeburg sandy loam ranges from undulating to hilly, and the drainage from good to excessive. All but the smoother areas of the type are subject to erosion. There are numerous steep-sided gullies where the vertical drop from the upland is 50 feet or more. The steeper slopes, where cultivation has been attempted, are subject to destructive erosion and "galled spots" of red sandy clay are numerous. Such places should be kept in forest or planted to Bermuda grass or some other soil-binding plant or, if cultivated, plowed with the contour.

The native forest growth consists largely of longleaf and other pine, with oak, gum, and other deciduous trees. Lespedeza, which is quite abundant, broom sedge, and other native grasses furnish pasturage.

A great variety of crops can be grown on this soil. It produces larger yields of cotton and corn than any of the sand types. Leguminous crops, such as peanuts, velvet beans, cowpeas, lespedeza, and beggarweed, have been grown extensively enough to prove their value in general-farming rotations. Sweet potatoes and other vegetables, as well as pecans and Keiffer and Garber pears, do well. The Elberta peach, as well as a large number of other varieties, reaches its highest development on this soil, but peach production on a commercial scale is not at present profitable, owing to the inaccessibility of markets.

Moderate applications of fertilizer, usually analyzing 10–2–2, as well as the incorporation of organic matter, are held necessary to produce profitable yields. The best located areas of this type are valued at $25 to $35 an acre, while other areas sell for less than half these prices.

Susquehanna Series.

The Susquehanna surface soils are gray to reddish, the reddish colors usually being more pronounced in the heavier members of the series. The subsoils are mottled red and gray or red, gray, and yellow, and consist of plastic, heavy clay. The color of the subsoil varies, often being red, white, drab, yellow, and sometimes purple, although red practically always predominates, the other colors appearing only as mottlings in the lower part of the section. The Susquehanna series is most extensively developed in the higher part of the Coastal Plain, from the vicinity of Chesapeake Bay to central

Texas. The soil material is derived for the most part from unconsolidated Coastal Plain sediments, modified locally in Barbour County by limestone formations. Three members of this series are mapped in Barbour County—the sandy loam, fine sandy loam, and clay, the last with a hilly phase. A small development of Oktibbeha clay is mapped with inclusion symbols in areas otherwise shown as Susquehanna clay.

SUSQUEHANNA FINE SANDY LOAM.

The Susquehanna fine sandy loam, to a depth of 4 to 6 inches, consists of a grayish fine sand to loamy fine sand, passing into a yellowish to reddish fine sandy loam which at about 8 to 10 inches is underlain by a red, stiff, heavy, plastic clay. The surface soil is undergoing constant change through erosion, owing to the effects of which it is in places difficult to distinguish this type from the Susquehanna clay, and in places the line of demarcation is arbitrarily drawn. The red subsoil usually grades through lighter shades of red to yellowish red, and below 15 to 20 inches it is always mottled with shades of gray and yellow, and contains narrow streaks of deep red. The plasticity of the subsoil increases with depth and is greater where drainage is poor.

In sections where the material is in part derived from the Tertiary limestones the close resemblance of this type to parts of the Orangeburg soils renders it necessary to draw arbitrary boundary lines. In the northern part of the county, where the Ripley formation influences the subsoil, it is often markedly micaceous and may be a red, heavy, sticky sandy clay.

The Susquehanna fine sandy loam occurs principally in the northern half of the county, though there are scattered areas throughout the southern part. The type is known as "gray land with stiff clay subsoil."

The topography is rolling to sloping, and, with the exception of the steeper slopes to the streams where erosion has been very active, the proportion of waste land is low. The eroded slopes are best used for pasture or forestry.

The Susquehanna fine sandy loam is retentive of fertilizer and moisture and can be readily improved. Since the Civil War large areas have been farmed continuously by tenants, and as a result of careless handling many valuable tracts have declined in productiveness. At present, with liberal fertilization, this soil is capable of producing about one-half bale of cotton or 12 to 15 bushels of corn per acre. Of other crops slightly higher yields are obtained than on the Susquehanna clay. Those areas having the deeper surface soil can be handled under a wider range of moisture conditions than those on the steeper slopes, where "galled spots" are numerous.

Better yields are reported in the southern part of the county, where velvet beans, cowpeas, beggarweed, and peanuts are grown, and followed by fall and winter grazing.

Profitable yields can not be obtained without fertilization. The practice of systematic rotations would do much to improve the soil. On nearly every farm there are eroded areas suitable for use as pasture and forest land. Cattle raising has been recently revived on this type in the vicinity of Comer. Such plants as Bermuda grass and bur clover combined furnish valuable pasturage the year round.

Land values range from $8 to $10 an acre in the southern part of the county, and from $5 to $8 in the northern part.

SUSQUEHANNA SANDY LOAM.

The Susquehanna sandy loam is a grayish sand to loamy sand, underlain at an average depth of 5 inches by a yellow or reddish-yellow sandy loam, which in turn, at a depth of 7 to 12 inches, passes abruptly into a red, compact, plastic clay subsoil. The upper subsoil is seldom mottled, but below 24 inches narrow, banded mottlings of gray, bright red, brown, and drab, usually occur. In places the surface soil carries numerous iron concretions and platy fragments of brown, coarse sandstone.

This type is inextensive. It occurs mainly in the northern tier of townships. The largest area is found east of Spring Hill. The topography ranges from undulating to steeply sloping. Erosion is active and the type washes even on rather gentle slopes. There are many spots in which the red clay subsoil appears at the surface.

The native forest growth and the crops produced on this type are about the same as on the Susquehanna fine sandy loam. Cotton and corn are the principal crops grown. The yields are larger than on the Susquehanna clay. Land values range from $10 to $20 an acre.

SUSQUEHANNA CLAY.

The surface soil of the Susquehanna clay is a red to dull-red, plastic, sticky clay, with an average depth of 8 inches. The subsoil is a red, plastic clay which becomes yellowish red at a depth of 24 to 30 inches, below which the reddish color is replaced by mottled shades of drab, gray or yellow. In virgin forests and other uneroded areas the surface is often covered with 1 to 3 inches of fine sandy material, which adds to the value of the soil by increasing its friability. Where well supplied with organic matter, as in forests, the surface soil has a rich, brown color. The depth of the surface soil depends largely upon the erosion that has taken place. Red " gall spots " are so numerous as seriously to diminish crop yields.

Owing to its heavy, impermeable structure, the mottlings in the subsoil of the Susquehanna clay differ from those found in any other soil in the county. They consist of narrow, vertical bands of extremely red material faced by bands of gray, yellow or drab. On high, recently eroded knolls in the northern third of the county the subsoil may grade into a whitish, chalky formation. These areas do not differ noticeably from the typical soil in productiveness. Small patches of Houston clay, an acre or less in extent, included in this type, are conspicuous during the growing season by the luxuriance of the growth of cotton or corn.

Near the Bullock County line, northwest of Comer, "hog-wallow" land is common on this type, occurring on flat-topped divides, usually where water does not escape rapidly. The surface appears as a succession of basin-shaped depressions, several hundred of which may occur to an acre. The soil here is heavy clay, droughty and hard to till, but gives good yields in favorable seasons.

Over the northern half of the county, where this type is derived in large part from the Ripley marls, considerable mica occurs in both soil and subsoil, so that the material in places is less plastic than usual and more closely resembles the Ruston material. The inextensive areas of this type in the southern part of the county are derived from the Nanafalia formation,[1] a limestone which has been replaced by a siliceous rock. In many places the soil resembles a very compact phase of the Orangeburg, and in such cases the line of division was of necessity rather arbitrarily drawn. The material is not micaceous. It is intensely red in the upper part and lighter red in the lower part. The siliceous fragments closely resemble limestone, and it is a common belief that they are calcareous, but they do not effervesce and bear no lime. There are many limy outcrops in the northern part of the county, and in a few places the intensely red soil rests directly upon the grayish, decomposed Ripley marls, clearly proving the limestone origin of the overlying soils, although slight acidity in the upper part of these red areas is usually indicated by the litmus test.

With the exception of a few scattered patches, the Susquehanna clay is confined to the northern part of the county. Large typical areas are located north of Fairmount, north and south of Comer, and in the Cowikee Valleys. The topography varies from hilly in the sections adjacent to the hilly phase to rolling in other locations. The general elevation of the type is lower than that of the Norfolk, Orangeburg, and Ruston soils. Both surface run-off and underdrainage are adequate, in places excessive, and there are no poorly drained areas. A comparatively large number of intermittent

[1] The identification of the Ripley and Nanafalia formations was made by Dr. E. A. Smith.

streams cross the areas. The divides are rather broad and are separated by broad valleys with sloping sides. On account of the serious surface wash there has been a general decrease in the productiveness of the soil. However, when protected by terraces, hillside ditches or contour plowing, accompanied by the filling in of washed places, even the poorer parts of the type can be restored to a productive condition in a few years.

The only crops grown on this type in the northern part of the county are cotton and corn. Cotton yields range from one-half bale per acre on the best areas to one-fifth bale on the poorer areas, while corn yields from 6 to 8 bushels per acre. Individual farmers using modern methods easily double these yields. In the southern part of the county, in addition to cotton and corn, cowpeas, peanuts, velvet beans, and oats are produced. Here the yields are usually larger, owing mainly to the employment of better cultural methods. One orchard of pecans was observed. The trees appeared to be making rather slow growth, although in other respects their condition appeared satisfactory.

The implements and draft stock generally used on this type are like those used on the loose Norfolk sands, whereas this land requires a much heavier equipment, including disk plows, in order gradually to break the tenacious, intractable subsoil to greater depths and thus increase the root zone. Rotations including winter cover crops and green manuring crops are needed. Applications of about 1 ton per acre of burnt lime or 3 to 6 tons of Ripley marl material would also be beneficial. Cotton does well under present conditions when the moisture supply is ample, but is liable to considerable injury during dry periods.

Pasture grasses such as paspalum, Bermuda grass, Johnson grass, broom sedge, and such legumes as lespedeza, and white clover succeed very well on this soil, as do sorghum and cat-tail millet (Pencillaria). Wheat was formerly grown and there is no apparent reason why it should not have a place in rotations.

Many fields formerly cultivated have been abandoned and have reverted to forest of gum and pine.

Land values on the Susquehanna clay range from $5 to $15 an acre.

Susquehanna clay, hilly phase.—The hilly phase of the Susquehanna clay consists of a red, compact, tough clay, containing a small but variable quantity of sand, depending on the degree of erosion or colluviation. In places the surface soil to a depth of 2 to 5 inches consists of a grayish fine sand or very fine sandy loam. In the most recently eroded areas such soil covering is absent. The red clay may be 3 feet or more in depth and rests upon a lighter colored clay. Since the friable red material mantles the highest hills and overlies

the Ripley material, there are patches on the hilltops that possess all the characteristics of the Orangeburg, Ruston or Norfolk soils. This phase is rather inextensive and is found northwest of Eufaula on the mountains.

The phase differs from the typical soil in being hillier and more gullied, more easily eroded, and in having many variations in texture and structure. It occupies many steep-sided, V-shaped valleys, which are dry except during very wet weather. These valleys are separated by an intricate system of narrow-topped, winding, irregularly broken ridges ranging from a few feet in width to patches of an acre or more. The roads usually wind along these ridges and at intervals cross the steep gullies and less frequently the larger streams. The streams have a considerable fall.

Owing to its topography, most of this phase is unsuitable for agriculture. Patch farming can be carried on in the narrow valleys, on a few of the gentler slopes, and on the wider crests. The rougher areas are unsettled, while on the smoother areas not more than two or three families may be found to each square mile. The land is best used for pasturage and forestry. Much of it is being fenced. It is held in large tracts, often by nonresidents, who usually rent it to near-by landowners.

This phase has not shared in the general increase in land values throughout the country. It is valued at $2 to $6 an acre, depending on the extent of timber or bottom land and the nearness to markets.[1]

Oktibbeha Series.

The Oktibbeha soils are prevailingly dull brown to yellowish brown. The subsoils are composed of yellowish-brown to somewhat mottled yellow, gray, and red, rather plastic silty clay. These soils are underlain by soft, rotten limestone. The topography is flat to gently sloping. This series is developed only to a very small extent in Barbour County, and is represented by the clay type.

Oktibbeha clay.

A comparatively small area near Batesville shown in the Susquehanna clay color with inclusion symbol comprises the Oktibbeha clay.

The Oktibbeha clay, to a depth of about 6 inches, is a dark-red to chocolate-colored, stiff clay, mottled with yellow and gray. The subsoil is a yellow and drab, stiff, waxy clay, the predominating color in the upper portion being red. In the lower subsoil the lighter colors predominate. At depths ranging from 14 to 36 inches a greenish-yellow

[1] These figures represent cash sales made during the year of the survey.

clay containing a large percentage of chalky lime is encountered. There is usually present on the surface of the soil a shallow covering of very fine sand, which is seldom more than 2 inches deep. Where the land has not been cleared this mantle usually contains enough vegetable matter to give it a dark appearance, which, together with the "hog-wallow" surface, makes the type resemble the Houston clay.

The topography of the Oktibbeha clay is undulating to gently rolling and surface drainage is good.

The type is droughty. It is considered a hard soil to manage because it runs together when wet. It can be materially improved, however, by deep plowing and the addition of lime and organic matter. The soil supports a good growth of native grasses and legumes.

A sample of this soil, taken where the chalky limestone lies within 14 inches of the surface, analyzed about 37 per cent of lime carbonate between the depths of 6 and 36 inches,[1] notwithstanding which the surface 6 inches showed slight acidity. The lime in the subsoil could be dug out easily, crushed, and mixed with the surface soil. Land of this type is valued at $8 to $15 an acre.

Greenville Series.

The surface soils of the Greenville series are brown to dark red. The subsoils consist of deep-red or brick-red, friable sandy clays. The series occupies high rolling uplands in close association with the Orangeburg soils. It is evident that some of the Greenville soil mapped in Barbour County has been influenced by the underlying Clayton formation of limestone in the central part of the county and the Nanafalia in the southern part. Most of the material, however, is believed to be derived from the unconsolidated beds of sands and clays. Two types are mapped, the loam and sandy loam, the former having a heavy phase.

Greenville sandy loam.

The surface soil of the Greenville sandy loam is a reddish-brown loamy sand to sandy loam from 5 to 8 inches deep. The subsoil is a dark-red sandy loam to sandy clay loam, which passes abruptly at a depth of about 12 inches into a deep-red, friable, rather compact sandy clay. Soft iron concretions are not uncommon on the surface and platy fragments of sandstone are often seen on the steeper slopes.

This type is developed most extensively in an elongated ridge or belt extending from Clayton southwestward to McSwains Bridge,

[1] Analyses made at Auburn station. The same general results have been obtained in this region by the Bureau of Soils.

on the Pea River. A large area is found also southeast of Clayton around Hatfields Store. It was originally known as "oak-and-hickory land," on account of the almost exclusive growth of these hardwoods in the virgin forests. Reforested areas now support a growth of gum, oak, and longleaf and shortleaf pine. A considerable proportion of the land is under cultivation. The yields on the steeper slopes have been reduced to an unprofitable point by erosion and such areas are best used for pasture or forestry.

The topography ranges from rolling to steeply rolling, but it is seldom hilly except in the immediate vicinity of the smaller branches, which, as a rule, have cut channels very deep in proportion to the size of the streams. The drainage is thorough and on some of the sloping areas the run-off is rapid enough to remove the soil, giving rise to numerous "galled spots."

The type is largely kept in cotton, with little or no rotation. In the section northwest of Clio, however, legumes have been used in rotation with other crops, and increased yields have resulted. On areas not subject to erosion the ordinary yield of cotton is slightly in excess of one-half bale per acre. With the best cultural methods yields of 1 bale of cotton or 25 bushels of corn per acre are not uncommon. Oats are well suited to this soil and often yield 15 to 25 bushels per acre. Wheat should do well on the heavier parts.

This is a quick, warm soil, easily built up and maintained in a high state of productiveness.

Fertilization is necessary for profitable yields, although with the incorporation of sufficient organic matter in the soil, in such form as stable and green manures, the quantity of commercial mixtures necessary is greatly reduced. The fertilizers used vary greatly, the usual mixture having the formula 8–3–5, or as close an approximation to it as is possible with home mixing. Tenants use chiefly a 10–2–2 mixture. The use of potash salts on this type, as on other types with heavy subsoil, is believed unnecessary by many farmers, but in experiments conducted by the experiment station at Auburn the inclusion of potash in the fertilizer mixture has, in general, been found profitable.

The value of land of this type has always been high. At present it ranges from $10 to $40 an acre, with an average of about $17.

GREENVILLE LOAM.

The Greenville loam is a brown to dark reddish brown, mellow, friable loam with an average depth of 8 to 10 inches. The subsoil is a friable red clay, which grades into a heavy clay in the lower part of the 3-foot section.

The type is found in small areas southwest of Clayton, where it occupies gentle slopes. It has the same topography and forest

growth as the Greenville sandy loam, but is, on the whole, considered a better soil where not subject to ruinous erosion. Oats do especially well on this type, and wheat would apparently be a profitable crop. Yields of cotton and corn are about the same as on the sandy loam.

Greenville loam, heavy phase.—The surface soil of the Greenville loam, heavy phase, is a dark-brown to reddish-brown, heavy sandy loam to clay loam, having an average depth of 4 to 6 inches. The subsoil is a deep-red, friable, compact fine sandy clay or clay.

This phase is inextensive and represents an eroded phase of the sandy loam of this series. The principal areas are found about 1 mile southwest of Clayton, and in Secs. 3 and 4, T. 9, R. 25. The phase occupies rolling areas and slopes, which have in some cases been denuded of surface soil. The drainage is good to excessive.

When properly handled and supplied with organic matter this soil works into a loamy tilth. It is usually planted to cotton, and where the surface soil is not shallow produces from one-half to three-fourths bale per acre. With proper management much larger yields can be obtained. This is one of the best soils in Barbour County for oats, and corn, wheat, peanuts, and forage crops are well suited to it.

Houston Series.

The Houston surface soils are dark-colored, heavy, plastic clays and the subsoils are gray or greenish-yellow, plastic, waxy clays, underlain at varying depths by white, chalky limestone. They are highly calcareous, especially in the subsoil. These soils are derived from the weathering of calcareous clays, chalk beds, and rotten limestone. They are developed in Alabama, Mississippi, and Texas. One type, the Houston clay, is mapped in Barbour County.

HOUSTON CLAY.

The Houston clay is prevailingly a gray to dark-gray or rusty-brown, heavy clay with a depth of 5 to 10 inches, the depth depending somewhat on the slope and the effects of erosion. The surface soil is sticky and plastic when wet, but readily crumbles and becomes granular on drying. The subsoil is a grayish-yellow, waxy clay, which gradually becomes lighter colored downward, until at a depth ranging from 12 to 30 inches it grades into a very pale yellowish or whitish, decomposed chalk. Both soil and subsoil are normally calcareous, and the decomposed chalky portion of the latter may analyze 40 per cent or more of carbonate of lime.

On certain colluvial slopes where the type passes into the Susquehanna clay the surface soil is blacker and deeper than usual and the subsoil is a gray clay mottled with red. Where the Houston

clay merges into the Susquehanna clay the soil in the transitional zone has the surface appearance of the former and a subsoil identical with that of the Susquehanna type. These areas, often called "mixed post-oak land," are mapped as the Susquehanna clay.

The Houston clay is an inextensive type. It occurs in several small areas northwest of Comer and north of Batesville. In the latter section it occurs in scattered areas on the gentle slopes, rounded ridges, and low hills. It is known locally as "black prairie land," although in places it is covered with shortleaf pine, oak, and gum trees, with a scattered growth of cottonwood and cedar. Along the smaller streams willow and cottonwood flourish. At present the type supports an abundant growth of Johnson grass, lespedeza, melilotus, and broom sedge. A desirable large water grass is gradually encroaching in pastures and along hedges. Carpet grass also improves the pastures in certain moist locations.

The Houston clay is derived from the decomposition of an outlier of the Ripley marls. The area in Barbour County represents the easternmost extension of the "black-land belt" of Alabama and Mississippi.

The principal crops are cotton, corn, and hay. Cotton yields ordinarily about one-half bale an acre, corn, 20 bushels, and Johnson grass 2 cuttings, averaging a ton each.

Wherever it occurs this type is known for its lasting fertility, even under the poorest methods of farming. Many small patches, covering only a fraction of an acre, were recognized during the survey by the conspicuously better growth and greener color of cotton and corn. Little or no organic matter is added to this soil, for which reason it is in rather poor physical condition and is apt to crust following heavy rains. Increasing the organic-matter content would reduce the plasticity and increase the granulation. Commercial fertilizers are not used.

The value of this land, usually sold in connection with the surrounding soils, ranges from $8 to $12 an acre.

Cahaba Series.

The surface soils of the Cahaba series are gray or brownish gray and the subsoils yellowish red to reddish yellow. The series is developed on old stream terraces now well above ordinary overflows and usually fairly well drained. The component material is derived from wash from the adjacent uplands of the Coastal Plain, the mineral of which is here largely of Piedmont origin. The topography is undulating to flat. The series is extensively developed in Alabama and Mississippi. Only one type, the Cahaba fine sandy loam, with a heavy phase, is mapped in Barbour County.

CAHABA FINE SANDY LOAM.

The Cahaba fine sandy loam is a grayish fine sand to loamy fine sand, underlain at an average depth of 5 inches by a yellowish to yellowish-red loamy fine sand to fine sandy loam. This in turn, at 10 to 15 inches, passes into a yellowish-red or dull-red, friable fine sandy clay, which is often compact. In places where the underlying clay lies nearer the surface the color is reddish. Areas of loamy sand too small to separate on the map are included with this type. In all important features, aside from physiography and origin, this soil closely resembles the Ruston fine sandy loam of the uplands.

This type occurs in scattered areas on the better drained portions of the Chattahoochee River terraces. The topography is nearly level, but drainage is good.

On account of the many areas of shallow soil and the low content of organic matter, the yields are prevailingly low, but they are higher than on the Kalmia fine sandy loam, owing to the superior drainage of the Cahaba. The two types have about the same crop adaptation.

Cotton ordinarily yields about one-fourth bale and corn about 8 to 10 bushels per acre. With heavy applications of fertilizer these yields can be materially increased. Much of the type is used for pasture land, Bermuda being the principal grass, with lespedeza in the moister locations.

Cahaba fine sandy loam, heavy phase.—The heavy phase of the Cahaba fine sandy loam consists of a dull-red to reddish-brown clay loam to silty clay loam, underlain at about 6 inches by a reddish clay loam which grades into a reddish-yellow clay at about 24 inches.

The phase occupies a fairly level position above overflow on the second terraces of the Chattahoochee River. It has good natural drainage. The soil material is derived in large part from sediments washed from the Piedmont region to the north.

This is naturally a strong soil and is capable of producing good crops where care is taken to maintain a high content of organic matter.

KALMIA SERIES.

The surface soils of the Kalmia series are light gray to gray, ranging to grayish yellow, and the subsoils are yellow, with mottlings of gray and yellow in the lower portion. In the better drained situations the subsoils are yellow, the soils of such areas resembling very closely the corresponding members of the Norfolk series. The Kalmia series is developed along streams of the Coastal Plain region on terraces lying largely above overflow. It occurs most extensively in Mississippi and Alabama. The soils are composed largely of material washed from Coastal Plains soils, although along the larger streams issuing from the Appalachian Mountains and Piedmont Plateau more

or less sediment from these regions is mixed with the deposits. Three types of this series are mapped in Barbour County, the sand, fine sand, and fine sandy loam, the last with a deep phase.

KALMIA SAND.

The Kalmia sand is a gray to yellowish-gray sand, underlain at about 6 inches by a pale-yellow to yellow sand extending to a depth of 3 feet or more. The color and texture vary somewhat with differences in topography. A darker color than usual is found where seepage water has favored the growth of water-loving plants and their slow decay.

The Kalmia sand of the terraces corresponds to the Norfolk sand of the uplands in all important characteristics except topography and origin. Its level topography and the presence of the water table within 5 to 10 feet of the surface render it less susceptible to extremes of moisture than the Norfolk sand, and it is in all respects a better soil than the latter.

Aside from a few unimportant areas along the Pea River, the Kalmia sand is developed mainly on the third terraces of the Chattahoochee River. Large typical areas are found north of Eufaula, in Tps. 11 and 12, R. 29.

Most of this type is under cultivation, the yields being slightly greater than those on the Norfolk sand. It is used mainly for the production of cotton and corn. It is a "warm," early soil, and early vegetables and berries can be successfully grown. Large areas of the type are located on good roads within easy reach of Eufaula. The soil is deficient in organic matter, and heavy applications of fertilizer are required to produce profitable yields.

The selling price of land of this type ranges from $8 to $20 an acre, the higher price being obtained for those areas lying within a radius of 4 miles of Eufaula.

KALMIA FINE SAND.

The Kalmia fine sand consists of 5 to 7 inches of gray sand, underlain by a pale-yellow to yellow fine sand. In uncleared or moist locations the surface material is dark gray, but under continued tillage it assumes a bleached appearance. The amount of silty material increases with depth, and the lower subsoil is distinctly loamy and coherent. In eroded areas near the stream courses the surface soil is somewhat loamy. Soft, disklike iron concretions are quite common throughout the soil section.

This soil has its principal development in the eastern part of the county. A rather extensive area occurs in the vicinity of Batesville. Most of the type occupies the third terraces, with a small proportion on the second and occasional areas on a fourth terrace.

The areas on the lower terraces are gently undulating, while the higher lying areas have been eroded sufficiently to leave the surface a succession of swells and gentle slopes. Drainage is thoroughly established, and there is practically no wet land except occasional strips bordering the terrace escarpments, where it is subject to seepage.

This soil is deficient in organic matter, leachy, droughty, and unproductive. The principal crops are cotton, corn, oats, and peavine hay, all which give low yields. Cotton succeeds better than corn. The type is farmed chiefly by tenants, who use commercial fertilizers in order to obtain immediate results, but give little attention to the permanent improvement of the soil. The low yields are largely the result of the low organic-matter content. This can be best increased by the growing of such legumes as peanuts and velvet beans.

The agricultural value of the Kalmia fine sand is slightly below that of the other members of the Kalmia series, although it is on the whole higher than that of the corresponding upland type, the Norfolk fine sand.

KALMIA FINE SANDY LOAM.

The Kalmia fine sandy loam consists of a gray fine sand, underlain at about 5 or 6 inches by a pale-yellow loamy fine sand, which gradually becomes heavier with depth, until at 15 to 30 inches it grades into a subsoil of fine sandy clay. In poorly drained areas the soil is loamy, owing to the presence of a rather large quantity of decayed vegetable matter, and the subsoil of these areas, owing to lack of aeration, is a mottled yellow and gray color. South of Eufaula, within a distance of 5 miles, and between Cowikee Creek and the Russell County line, there are a few scattered areas of Kalmia loamy sand which are included with this type on account of their small size. There are also included some small areas of Kalmia sandy loam on the second and third terraces of the Chattahoochee River.

The Kalmia fine sandy loam occupies level areas and is found principally on the second terraces of Barbour and Pea Creeks and the Chattahoochee and Pea Rivers. Drainage is usually well established, but in some of the lower areas artificial drainage is necessary before the land can be used for crop production. These undrained areas are known as "gallberry land" from the prevailing growth of gallberry.

The material of the better areas of this type bear a close resemblance to Norfolk material, and in places it is difficult to distinguish between the two series. The Kalmia is more valuable than the Norfolk, however, owing to the more certain water supply and the consequent greater ability to withstand drought.

This soil is much in need of vegetable matter, which can be best supplied by turning under green manuring crops. Moderate applications of high-grade fertilizers are at present necessary for profitable crop yields, and liming would undoubtedly prove beneficial, especially in the poorly drained places. Under present conditions corn yields from 7 to 10 bushels and cotton about one-fourth bale per acre. During the year of this survey (1914), in which the early seasonal conditions were favorable, oats yielded as much as 45 bushels per acre on ground only fairly well prepared. Peanuts, cowpeas, and lespedeza produce heavy yields.

Several pecan orchards have been planted, and while they have not yet come into full bearing, they are apparently making satisfactory progress.

Land of this type sells at $10 to $30 an acre, depending on location and improvements.

Kalmia fine sandy loam, deep phase.—The surface soil of the deep phase of the Kalmia fine sandy loam is a light-gray to whitish fine sand, underlain at an average depth of 5 inches by a pale-yellow sand which extends to a depth of 20 to 30 inches. Recently cleared areas have a darker gray color, caused by the larger content of vegetable matter, but this soon disappears under cultivation. The subsoil is a yellow, friable fine sandy loam. In character of material both soil and subsoil closely approach the Norfolk fine sand. Moisture conditions are better on this type than on the Norfolk soils, largely because the position of the Kalmia soil is lower and the topography flatter.

This phase is developed northeast and south of Eufaula, where it occupies the gently undulating terraces along the Chattahoochee River. Both surface drainage and underdrainage are well established.

The agricultural value of this phase is higher than that of most of the sandier Kalmia soils, owing largely to its greater and more dependable moisture supply, but it is not quite so good a soil as the typical Kalmia fine sandy loam. Sweet potatoes, melons, sugar cane, and vegetables are among the crops that succeed best on soils of this character. Cotton and corn are grown with fair success, but rather heavy fertilization is needed to insure profitable yields. The soil warms up early and responds readily to applications of organic matter and commercial fertilizer. Land of this phase sells at about the same price as the typical soil.

Leaf Series.

The surface soils of the Leaf series are light gray to gray, closely resembling the Kalmia soils. The subsoils characteristically consist of gray or mottled gray, red, and yellow, compact, rather plastic

silty clay, which grades downward into a mottled red, gray, and yellow plastic clay. These soils are typically developed on stream terraces in the Coastal Plain region, and where they occur in association with the soils of the Susquehanna series they resemble the latter quite closely. They are usually less valuable than the Susquehanna soils, however. In Barbour County the series is represented by one type, the fine sandy loam.

LEAF FINE SANDY LOAM.

The surface soil of the Leaf fine sandy loam consists of a gray to dark-gray or nearly black fine sand or loamy fine sand which passes abruptly into a yellow or grayish fine sandy loam. The subsoil, beginning at 6 to 12 inches, is a mottled red and yellow plastic clay or a yellowish, moderately plastic fine sandy clay which grades into a mottled gray, yellow, and red plastic clay. In the higher, better drained areas of the type the material sometimes consists of a grayish fine sand or loamy fine sand, underlain at 15 to 20 inches by a yellow or mottled yellow and gray fine sandy loam, similar to the subsoil of the Kalmia fine sandy loam, but which passes within the 3-foot section into a stiff fine sandy clay, mottled gray, yellow, and red. The soil in the more poorly drained situations is always darker colored than that in the higher, better drained areas. Along the foot of the uplands there are frequently strips of colluvial soil in which the depth to the clay is greater than usual. The type is comparable in many respects, especially in the nature of the subsoil, to the Susquehanna fine sandy loam, an upland type. South of Eufaula, on Cheneyhatchee Creek, there are a few patches of Leaf silt loam which are included with this type on account of their small extent.

The Leaf fine sandy loam occurs on the second terraces along the rivers and creeks which flow through areas of Susquehanna and other soils having stiff, plastic subsoils. It is not subject to overflow. A broad stretch of country along Cowikee Creek and its forks, representing the most valuable lands in this section of the county, consists predominantly of this type. These tracts are known throughout the county as the "Cowikee lands."

The topography of the Leaf fine sandy loam is nearly level. Slight depressions occur which require artificial drainage on account of the imperviousness of the subsoil and the consequent lack of underdrainage, especially in those areas where the stiff clay occurs near the surface.

The Leaf fine sandy loam is not generally as productive as the Kalmia fine sandy loam. It produces fair yields of cotton, oats, corn, sugar cane, peanuts, and sorghum. The best use to which it has been put in this county is for the production of hay. Lespedeza

does very well. Yields vary considerably from year to year, owing to the uncertain moisture conditions. In wet years the yield of cotton is low, and corn suffers during exceptionally dry seasons. The soil is benefited by growing and plowing under occasional crops of cowpeas and applying ground limestone.

Land of this type sells at $10 to $25 an acre, depending largely on location and improvements.

Results of mechanical analyses of samples of the soil and subsoil are given in the table below:

Mechanical analyses of Leaf fine sandy loam.

Number.	Description.	Fine gravel.	Coarse sand.	Medium sand.	Fine sand.	Very fine sand.	Silt.	Clay.
		Per cent.	*Per cent.*	*Per cent.*	*Per cent.*	*Per cent.*	*Per cent.*	*Per cent.*
414813	Soil	0.2	2.0	2.7	59.4	19.2	13.2	3.4
414814	Subsoil	.2	.4	.4	4.3	8.4	32.3	54.1

CHATTAHOOCHEE SERIES.

The Chattahoochee soils are grayish brown to red, and the subsoils are red, having a compact but friable structure. The series is found on the higher terraces of Coastal Plain streams. The series is well drained both in the subsoil and surface portions. In the case of streams rising in the Piedmont Plateau a large proportion of the material owes its origin to that source. The Chattahoochee fine sandy loam is mapped in Barbour County.

CHATTAHOOCHEE FINE SANDY LOAM.

In its characteristic development the soil of the Chattahoochee fine sandy loam is a grayish or yellowish to brownish-gray fine sand to loamy fine sand extending to an average depth of 6 inches. The subsoil is a dull-red to reddish-brown fine sandy clay, compact and rather stiff in places. On the crests of gentle swells the soil may be 12 to 24 inches deep, in which case the lower portion is loamy in texture and reddish in color. Spots having a red loamy sand subsoil are encountered.

On the first bottoms along the Chattahoochee River are narrow bands of reddish-brown fine sandy loam carrying a considerable content of finely divided mica. This soil is subject to overflow and would have been mapped separately had its extent warranted.

The Chattahoochee fine sandy loam occupies nearly level second terraces along the Chattachoochee River, lying ordinarily above overflow. The type is sufficiently level to allow the use of improved types of farm machinery. As a rule drainage is ample, although patches

having a compact subsoil may be excessively wet in seasons of heavy rainfall and require artificial drainage to fit them for cultivation.

The type is owned in large estates, and is farmed by tenants or managed by overseers. It is largely under cultivation.

Cotton is the principal crop, although each farm usually includes small patches of corn. Ordinarily the yields are low, but in favorable seasons and with liberal fertilization as much as 1 bale of cotton per acre has been obtained. The type is a warm, early soil, easily built up to a high degree of productiveness by proper methods of cultivation. At present the soil is markedly low in organic-matter content. The application of either ground or burnt lime is beneficial. Near-by outcrops of the soft, chalky Ripley marls afford a convenient source of supply of lime.

This is a desirable soil for general farming. Its average value ranges from $10 to $25 an acre.

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

Mechanical analyses of Chattahoochee 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.*
414807	Soil	0.2	1.6	1.6	36.8	34.4	20.1	5.2
414808	Subsoil	.0	1.0	.6	10.2	17.0	27.6	43.5

OCHLOCKONEE SERIES.

The Ochlockonee soils are prevailingly dark gray to brown, the color depending in a large measure on the accumulation of vegetable matter. The subsoils are generally dark gray to brown, the color varying with the subsoil drainage. Where this is deficient, mottlings of yellow, brown, and gray appear, the gray being more pronounced in the wettest portion. The series is derived from the wash of upland soils of the Coastal Plain, and the soils are subject to frequent additions of upland material. The Ochlockonee types mapped in this county are the clay loam and the fine sandy loam.

OCHLOCKONEE CLAY LOAM.

The surface soil of the Ochlockonee clay loam consists of 6 to 8 inches of brown clay loam, usually mottled in the lower part with streaks of rusty brown. The subsoil is a mottled drab or yellow and gray clay loam, the proportion of the grayish color varying with drainage conditions. There is considerable variation in the surface material. In some places it has a high content of organic matter. In others it has the texture of a clay. Included with this type are

some areas of Ochlockonee fine sandy loam, Bibb silty clay loam, and Trinity clay too small to separate on the map. There is also some admixture of material from the Ripley formation.

This type occurs principally in the first bottoms of the Pea River and of a few other streams of the county of sluggish flow.

Drainage is poor, the type being inundated several times each year. Only occasionally do overflows occur during the growing season, however, and then they are usually of short duration.

Most of the type is covered with a dense growth of the water-loving trees common to the bottom lands. Cypress also occurs. When cleared and drained, the land produces good yields of corn, sorghum, lespedeza, carpet grass, Johnson grass, and Bermuda grass, as well as certain annual legumes, and affords good pasturage. Corn produces a remarkable growth of stalks, the plant often reaching a height of 8 to 14 feet, which makes it especially suitable for ensilage. In exceptionally dry seasons as much as a bale of cotton per acre has been obtained, but on the wetter areas cotton can not be depended upon to be successful in more than three years out of five. Cotton is also liable to injury by the boll weevil.

The estimated value of land of this type is $10 to $15 an acre, the price depending largely on the forest growth.

OCHLOCKONEE FINE SANDY LOAM.

The Ochlockonee fine sandy loam is a dingy-gray to grayish-brown loamy fine sand to fine sandy loam, underlain at about 10 inches by a grayish-yellow or mottled gray and yellow fine sandy loam, which in the lower part of the 3-foot section passes into a sandy clay loam. The type is subject to wide variations in color, texture, and structure. The subsoil is often irregular and imperfectly stratified with pockets of sandy material interspersed with lenses of clay. Owing to the steepness of the surrounding stream slopes, the side next the uplands may have consisted of strips of recent colluvial formation. The gradient of the streams that have built up this type ranges from 21 to 60 feet per mile, and on account of the consequent swiftness of stream flow the soil material is not as uniform in texture as in the case of materials found along the more slowly flowing streams, such as the Pea River.

In places the surface soil consists of a reddish-brown fine sandy loam, underlain at variable depths, usually 8 to 20 inches, by reddish to yellowish or mottled grayish and rusty-brown fine sandy loam to sandy clay. In areas of this variation stratified layers and pockets of material varying widely in texture are common, and the subsoil at varying depths contains layers of dark-colored material. The variation represents old surface soil over which reddish soil material of the Orangeburg, Susquehanna, and Greenville series has recently

been deposited. Such areas are really Hannahatchee fine sandy loam, locally called "willow bottoms."

On account of the nearness of the water table to the surface and the fact that the lower subsoil is often in a condition of permanent saturation, textural variations do not affect crop production as greatly as in the case of the drier soils of the upper terraces.

This type occupies the nearly level first bottoms of the larger creeks throughout the county. The areas need ditching and diking to protect them from frequent flooding. A considerable proportion of the land has been rather imperfectly drained by ditching and by straightening the streams, but tiling will be necessary to drain the wet subsoil properly.

The type is at present quite largely under cultivation. Uncleared areas are covered with sweet gum, bay, oak, swamp maple, swamp alder, pine, and birch, with an undergrowth of blackberry, bamboo, and switch cane. Several species of water-loving grasses and sedges furnish grazing. Good yields of cotton and corn are produced, and sirup of good quality is made from sugar cane grown on the lighter colored areas. The use of fertilizer is not general, although phosphoric acid gives good results. In growing sugar cane a complete fertilizer is used.

This type is valued chiefly for winter pasture for hogs and cattle and for the production of corn and sugar cane.

Below are given the results of mechanical analyses of samples of the soil and subsoil of the Ochlockonee fine sandy loam:

Mechanical analyses of Ochlockonee 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.*
414815	Soil	0.0	0.2	0.6	54.4	25.6	10.9	8.1
414816	Subsoil	.1	.6	1.2	54.7	19.4	13.7	10.3

MYATT SERIES.

The Myatt soils are gray to dark gray. The subsoils are of gray to mottled gray and yellow color and impervious character. The soils of this series represent the most poorly drained parts of the Coastal Plain stream terraces. They lie principally above overflow, but are so flat that water stands for long periods after heavy rains. They are composed of about the same character of material as the Kalmia and Cahaba soils. This series is developed only to a small extent in Barbour County.

MYATT FINE SANDY LOAM.

Areas mapped with the Ochlockonee fine sandy loam and indicated on the map by inclusion symbol represent the Myatt fine sandy loam.

This consists of a gray to dark-gray sand, in many places high in organic matter and loamy. At 7 to 12 inches the subsoil appears as a grayish-drab, mottled yellow and gray or a light-gray fine sandy clay. The subsoil is plastic in the lower part and relatively impermeable. In wet seasons the soil is swampy; in dry weather crops suffer from drought.

The type occupies poorly drained depressions on the terraces of the Chattahoochee River, and along the Pea River flat areas which receive seepage water from the adjacent uplands. This land at present has no agricultural use, being valued for timber and pasturage. When fully reclaimed it should make a productive soil.

Miscellaneous Material.

MEADOW.

Meadow includes the first-bottom alluvium of the smaller streams of the county. This material is so variable in color, texture, and structure, and in many places is subject to such continual change that separation into soil types can not be made. The soil is constantly being modified by colluvial wash from the adjoining uplands. In places there is generally no marked difference in texture between the soil and subsoil, in others the entire 3-foot section is irregularly stratified with material of various textures and colors. At depths ranging from 2 inches to a foot or more the subsoil is generally mottled with gray, rusty brown, and pale blue, the gray predominating.

A considerable proportion of the meadow occurs in narrow areas along incipient drainage ways and where the alluvial accumulations are too small to map in detail. Such strips are encountered on nearly every farm in the county.

The forest growth on meadow consists of willow, alder, and other trees common to the bottom-land types. This soil is of considerable importance in the production of sorghum, sugar cane, and corn. Most of the sugar cane grown in the county is produced on it. The yields range from 150 to 400 gallons of sirup per acre. The sirup is of fine quality, especially when the cane is grown on areas having a well-watered subsoil and where the soil is light colored and not too rich in organic matter.

Considerable areas have been cleared and drained and are profitably used for the production of general farm crops. Carpet grass and lespedeza thrive. Cotton grown on this soil is damaged considerably by the boll weevil.

SUMMARY.

Barbour County is situated in the southeastern part of Alabama, bordering the State of Georgia. It comprises an area of 906 square miles, or 579,840 acres.

The topography ranges from hilly and broken to nearly level. The drainage is well developed, though all streams are still actively cutting to lower levels. The rate of stream fall ranges from 6 inches a mile in the case of the Chattahoochee River to 60 feet a mile in the case of smaller streams. About one-third of the county is above the 400-foot level, the elevation ranging from 125 feet along the Chattahoochee River to 665 feet north of Clayton.

The rural population averages 31 persons to the square mile. Settlement is much denser in the southern part of the county than elsewhere. Rail or water transportation facilities are available to most parts of the county, but there is a lack of adequately improved highways.

The climate is mild. The mean annual temperature is 64.7° F. The mean annual precipitation is 52.25 inches. The driest year on record had 42 inches and the wettest (1912) 70 inches.

About one-half of the area of the county is under cultivation. Owing to erosion under cultivation considerable land once productive is no longer tilled. Considerable areas are in forests, mainly of shortleaf and longleaf pine and some oak.

Cotton is the chief money crop. Corn is the main feed crop, but hay, oats, peas, velvet beans, and sorghum are grown. Potatoes, sugar cane, sorghum, watermelons, berries, and fruits are minor products, grown chiefly to supply home requirements.

Systematic rotations are not followed. Considerable care is taken in the purchase of seed cotton and seed corn, although little care is taken to keep varieties pure. Large quantities of fertilizer are used. Most of the farming is done by tenants. Land values range from $2.50 to $30 an acre. The average for the county is probably about $10 an acre. Farm lands have doubled in value in 10 years.

Soils of 13 series, including 24 types, in addition to several phases and included types, and the miscellaneous type, Meadow, are mapped in the survey of Barbour County.

The upland is occupied by soils of six series, the Norfolk, Ruston, Orangeburg, Susquehanna, Greenville, and Houston.

The Norfolk series comprises four types. The fine sand is a well-drained type of small extent. The coarse sand is likewise inextensive. It is leachy and naturally unproductive. The sandy loam is a well-drained soil of moderate extent and productiveness. The Norfolk sand is the most extensive Norfolk soil mapped. It is largely cleared and under cultivation. The typical sand is of porous structure, but under the best management it produces good yields. The Norfolk soils are as a whole droughty and loose and are deficient in organic matter and lime.

The Ruston series comprises three types. The gravelly sandy loam is an extensive soil. It is excessively drained and droughty,

but in wet years crops do better on it than on some of the inherently more productive soils. The sandy loam is extensively developed in the southern townships. It gives average yields probably higher than any other extensive upland soil. The Ruston fine sandy loam is not of large extent. Owing to its finer texture, it withstands drought better than the sandy loam.

The Orangeburg series in this county comprises only the sandy loam type. This soil has a wide range of crop adaptation. It is especially well suited to peaches, as well as bush and other tree fruits. Land values are relatively high.

The Susquehanna series comprises three types in this county. The sandy loam and fine sandy loam require fertilization for profitable yields, but are readily improved. The clay type is developed largely in the northern part of the county. Yields on it under the present methods of farming are low, but it is productive in favorable seasons. It includes a hilly phase, which has a rougher topography and is unsuitable for farming except in patches. One small area of Oktibbeha clay, a soil having a good growth of native grasses, is mapped with the Susquehanna clay.

The Greenville is an important series. The sandy loam type is a productive soil, largely in cotton. Its topography, like that of the loam, is rolling. The loam and its heavy phase are productive soils, especially well suited to oats and wheat.

The Houston series is represented by a single type, the clay. This is a gray, heavy-textured soil, of calcareous origin, inextensive in Barbour County, but important because of its productiveness.

The terrace, or second-bottom, soils comprise the Cahaba, Kalmia, Leaf, and Chattahoochee series.

The Cahaba fine sandy loam and its heavy phase occupy nearly level though well-drained areas on the Chattahoochee River terraces. The soils are low in organic matter, but can be readily improved.

The Kalmia sand, fine sand, and fine sandy loam are largely under cultivation. These are early types, but they are low in organic matter and require heavy fertilization. The deep phase of the fine sandy loam is the best of the Kalmia soils, owing largely to its power to conserve moisture. The Kalmia soils can be brought to a high state of productiveness.

The Leaf fine sandy loam produces fair yields of the staple crops. Its best use at present is as hay land. In very wet years cotton gives low yields. In abnormally dry years corn yields poorly.

The Chattahoochee fine sandy loam is largely under cultivation. Yields on this type are generally low, although under the best methods of farming it gives high yields of the common crops. Both it and the Leaf fine sandy loam are benefited by applications of some form of lime.

The Ochlockonee clay loam and fine sandy loam occupy first bottoms along the Pea River and the larger creeks of the county. The clay loam has poor drainage, but gives good yields of cotton in dry years. The fine sandy loam is largelv under cultivation, but extensive ditching is needed. It produces good yields of cotton and corn, and sugar cane for sirup. Areas of Myatt fine sandy loam are mapped with the Ochlockonee, distinguished by symbol. The Myatt is not utilized at present, but can be reclaimed and made productive.

Meadow comprises alluvial first-bottom material along the smaller streams, where the texture of the soil and the arrangement of materials in the soil profile are so variable that separation into types is impracticable. Much of the Meadow in Barbour County has been drained and put under cultivation.

[PUBLIC RESOLUTION—No. 9.]

JOINT RESOLUTION Amending public resolution numbered eight, Fifty-sixth Congress, second session, approved February twenty-third, nineteen hundred and one, "providing for the printing annually of the report on field operations of the Division of Soils, Department of Agriculture."

Resolved by the Senate and House of Representatives of the United States of America in Congress assembled, That public resolution numbered eight, Fifty-sixth Congress, second session, approved February twenty-third, nineteen hundred and one, be amended by striking out all after the resolving clause and inserting in lieu thereof the following:

That there shall be printed ten thousand five hundred copies of the report on field operations of the Division of Soils, Department of Agriculture, of which one thousand five hundred copies shall be for the use of the Senate, three thousand copies for the use of the House of Representatives, and six thousand copies for the use of the Department of Agriculture: *Provided,* That in addition to the number of copies above provided for there shall be printed, as soon as the manuscript can be prepared, with the necessary maps and illustrations to accompany it, a report on each area surveyed, in the form of advance sheets, bound in paper covers, of which five hundred copies shall be for the use of each Senator from the State, two thousand copies for the use of each Representative for the congressional district or districts in which the survey is made, and one thousand copies for the use of the Department of Agriculture.

Approved March 14, 1904.

[On July 1, 1901, the Division of Soils was reorganized as the Bureau of Soils.]

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