Issued July 31, 1916.

U. S. DEPARTMENT OF AGRICULTURE.

BUREAU OF SOILS—MILTON WHITNEY, Chief.

IN COOPERATION WITH THE STATE OF ALABAMA, CHARLES HENDERSON, GOVERNOR; J. A. WADE, COMMISSIONER OF AGRICULTURE AND INDUSTRIES; EUGENE A. SMITH, STATE GEOLOGIST.

SOIL SURVEY OF WALKER COUNTY, ALABAMA.

BY

J. O. VEATCH, OF THE U. S. DEPARTMENT OF AGRICULTURE, IN CHARGE, AND A. M. O'NEAL, JR., AND J. F. STROUD, OF THE ALABAMA DEPARTMENT OF AGRICULTURE AND INDUSTRIES.

HUGH H. BENNETT AND W. EDWARD HEARN, INSPECTORS, SOUTHERN DIVISION.

[Advance Sheets—Field Operations of the Bureau of Soils, 1915.]

WASHINGTON:
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1916.

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LETTER OF TRANSMITTAL.

U. S. DEPARTMENT OF AGRICULTURE,
BUREAU OF SOILS,
Washington, D. C., February 3, 1916.

SIR: In the extension of the soil survey in the State of Alabama during the field season of 1915 a survey was undertaken in Walker County. This work was done in cooperation with the Alabama Department of Agriculture and Industries, and the selection of the area was made after conference with State officials.

I have the honor to transmit herewith the manuscript report and map covering this work and to request their publication as advance sheets of Field Operations of the Bureau of Soils for 1915, as authorized by law.

Respectfully,

MILTON WHITNEY,
Chief of Bureau.

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

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SOIL SURVEY OF WALKER COUNTY, ALABAMA.

By J. O. VEATCH, of the U. S. Department of Agriculture, in charge, and A. M. O'NEAL, jr., and J. F. STROUD, of the Alabama Department of Agriculture and Industries.—HUGH H. BENNETT and W. EDWARD HEARN, Inspectors.

DESCRIPTION OF THE AREA.

Walker County is in the northwestern part of Alabama. It is the fourth county south of the northern boundary and the third county east of the western boundary of the State. It is bounded on the north by Winston and Cullman Counties, on the east by Cullman, Blount, and Jefferson Counties, and on the south and west by Jefferson, Tuscaloosa, Fayette, and Marion Counties. It has an area of 798 square miles, or 510,720 acres.

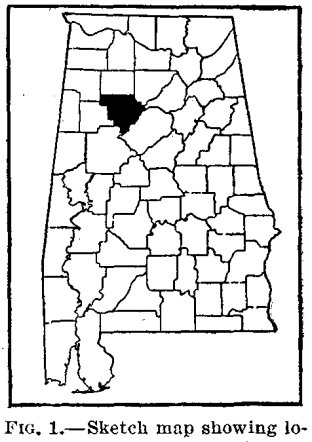

FIG. 1.—Sketch map showing location of the Walker County area, Alabama.

The county is situated in the southern extension of the Appalachian Plateau province. This is one of the major physiographic provinces of the United States, extending from northern Alabama to New York and lying directly west of and parallel to the Appalachian Valley region. This plateau region reaches a maximum elevation of 4,000 feet above sea level in West Virginia, the elevation gradually decreasing southward to about 500 feet in the southern part of Walker and the northern part of Tuscaloosa Counties. A short distance to the south and west of Walker County the plateau is completely buried beneath Coastal Plain strata, and a few eroded remnants of Coastal Plain strata appear in the western part of this county. The plateau in this locality may be regarded as the southern extension of the Cumberland Plateau of Tennessee.

In general the topography of Walker County is undulating to deeply dissected. The nearly uniform level of the higher stream divides indicates that the entire area originally was a nearly level, unbroken plain, the present topographic features being due to the modification of the original surface by stream erosion.

There are no well-defined topographic divisions, although there is considerable diversity in surface configuration in different parts of

the area. The northern part of the county, or, roughly, the section north of Carbon Hill and Jasper and west of Sipsey Fork, is undulating to moderately broken, and shows but little topographic variation, because there has been relatively little stream erosion. The central part of the county is hilly, with a considerable area of rough, broken country, while areas in the southern part of the county and elsewhere adjoining the courses of the rivers and larger creeks are so minutely and deeply dissected by streams that they present a mountainous aspect. In the more broken country the larger streams have cut deep, gorgelike channels, and the tributary streams occupy deep, narrow ravines. A profile shows a series of V's, the valley slopes being generally very steep, often dropping off precipitously from the very narrow, even-crested plateaus or divides.

The streams are irregular in the direction of their flow, and the ridges or stream divides are also without uniform direction or width, and have no definite arrangement or relation to one another.

The underlying rock strata consist of nearly horizontally bedded shales containing comparatively thin strata of sandstone. Some of the topographic features are due to inequalities in the hardness of the shale and sandstone and the structure of the strata. Some of the even-topped divides or table-lands are due to a capping of sandstone, while narrow but fairly level erosion benches or platforms appear in places in the valleys at various levels, being due to the removal by erosion of sections of the overlying shales down to the level of the harder sandstone beds. These erosion benches are a feature of the topography, especially in the southern part of the county.

Old alluvial terraces lying at elevations of 20 to 100 feet above the first bottoms occur along Mulberry Fork and other streams. They are generally narrow and of small extent and continuity and are not conspicuous features of the topography. Their recognition, however, is of importance in the correlation of the soils.

The range of elevation in the county is from 500 to nearly 700 feet above sea level, the slope of the country being southward. The larger streams have cut their channels 100 to 250 feet beneath the higher plateau levels.

The county is drained by the Black Warrior River and Mulberry and Sipsey Forks. While there is considerable difference in the number of small streams, and consequently in the topography, in different sections, all parts of the county are reached by streams, so that the natural surface drainage is everywhere adequate for agricultural purposes. In the more minutely dissected country adjoining the larger streams many of the slopes are so steep as to be of very little agricultural value.

While the streams are locally irregular in direction, as a whole they have a general southward and eastward flow. The larger streams have winding or meandering courses. The meanders are deeply intrenched and the streams occupy very narrow valleys or even gorges, so that in many places they have developed no flood plains. The smaller streams generally have steep gradients.

The population of Walker County, according to the 1910 census, is 37,013, of which 93.2 per cent is reported as rural, giving an average of 44.4 persons per square mile. A considerable part of the population, however, is centered in coal-mining camps and is not engaged in farming. Coal mining is the chief industry. Lumbering is an industry of considerable importance, and a little manufacturing is carried on. Agriculture, however, is gradually increasing in importance. Large areas of desirable farm land still remain to be improved. The farming population is predominantly white, the people being mainly descendants of early settlers who came into the county from the older Southern States, principally Georgia, South Carolina, North Carolina, and Tennessee.

Jasper, the county seat, is the most important town in the county. Its population is reported in the census of 1910 as 2,509. Carbon Hill has a population of 1,627 and Cordova a population of 1,747. The population of Oakman is given as 1,065, and of Dora as 916.

The St. Louis & San Francisco Railroad and the Southern Railway operate lines across the northern and central parts of the county and afford adequate transportation facilities. A number of spurs and branches have been built on account of the coal-mining industry, so that at present only a few areas in the extreme northern, northeastern, and southern parts of the county are remote from railways and more or less inaccessible. The Black Warrior River is navigable and Mulberry Fork as far north as Cordova. All the wagon roads are common dirt roads. In many places the grades are excessive, and the roads are in poor condition. The main highways, however, have recently been graded and in part relocated, and an interest is taken in the improvement of the public-road system.

The larger towns of the county and the coal-mining camps afford fair local markets for poultry, fruit, and garden produce. Memphis and Birmingham are the principal cotton markets.

CLIMATE.

The data in the following tables, giving the normal monthly, seasonal, and annual temperature and precipitation in Walker County, are compiled from the records of the Weather Bureau stations at Cordova and at Birmingham, the latter city being in Jefferson County, about 40 miles southeast of Jasper.

Normal monthly, seasonal, and annual temperature and precipitation at Cordova and Birmingham.

Month.	Cordova.				Birmingham, Jefferson County.					
		Precipitation.			Temperature.			Precipitation.		
	Temperature, mean.	Mean.	Total amount for the driest year.	Total amount for the wettest year.	Mean.	Absolute maximum.	Absolute minimum.	Mean.	Total amount for the driest year.	Total amount for the wettest year.
	°F.	*Inches.*	*Inches.*	*Inches.*	°F.	°F.	°F.	*Inches.*	*Inches.*	*Inches.*
December	43.4	5.01	1.39	4.08	47.3	76	5	4.40	5.05	4.01
January	42.6	5.13	3.30	4.02	45.3	77	7	5.65	3.84	5.20
February	44.3	5.31	5.49	6.43	48.3	81	−10	5.20	2.14	6.17
Winter	43.4	15.45	10.18	14.53	47.0	.....	.....	15.25	11.03	15.38
March	54.6	5.94	4.00	6.39	56.3	90	12	5.72	3.33	6.75
April	61.3	4.93	4.53	12.14	63.5	90	28	5.14	2.02	13.06
May	68.7	3.99	5.09	3.12	71.6	99	40	4.03	3.19	2.29
Spring	61.5	14.86	13.62	21.65	63.8	.....	.....	14.89	7.54	22.10
June	76.7	4.23	3.21	12.79	77.9	101	49	4.26	3.53	12.09
July	79.1	5.23	3.92	7.02	79.8	104	59	4.76	5.22	7.88
August	79.0	4.66	3.56	3.28	78.7	101	59	4.41	2.78	1.99
Summer	78.3	14.12	10.69	23.09	78.8	.....	.....	13.43	11.53	21.96
September	73.5	2.99	1.92	4.45	74.0	100	42	2.97	0.44	3.75
October	61.7	2.36	1.64	7.12	64.4	93	31	1.98	0.24	7.18
November	51.8	3.14	3.82	4.30	54.1	84	18	3.18	3.54	5.84
Fall	62.3	8.49	7.38	15.87	64.2	.....	.....	8.13	4.22	16.77
Year	61.4	52.92	41.87	75.14	63.4	104	−10	51.70	34.32	76.21

There are no wide variations in the climate of different parts of the county. The mean annual temperature is about 61° F. For the summer months of June, July, and August the mean temperature is about 78°, and for the winter months of December, January, and February it is about 43°. The mean temperature for the spring and fall months is about 62°. The lowest temperature recorded at Birmingham is −10° F., and the highest 104° F.

The precipitation is well distributed throughout the year. The mean annual precipitation is about 53 inches in Cordova and 52 inches at Birmingham. The total rainfall for the driest year recorded at Cordova is 42 inches. At Cordova the precipitation for the winter and spring seasons is about 15 inches each; for the summer it is about 14 inches, and for the fall months about 8 inches. Short periods of drought in the summer and early fall are not infrequent, but crops are rarely seriously injured where good cultivation is practiced.

The average date of the last killing frost in the spring is reported at Cordova as April 3, and that of the first in the fall as October 20. This gives a normal growing season of 200 days. At Birmingham the average date of the last killing frost in the spring is March 19, and that of the first in the fall, November 5; the latest date of killing frost recorded in the spring is April 17 and the earliest in the fall, October 22. Owing to the occasional occurrence of warm periods in February and subsequent freezes in March, peaches frequently are injured, and except where the orchards are protected by firing it has been the experience of growers that only one good crop may be expected every three years. The growing season is always ample for the maturing of cotton, except in the case of late plantings on the bottom lands.

AGRICULTURE.

The settlement of Walker County by considerable numbers of people began about the time of the establishment of the county in 1824. The increase in the farming population and the development of new land have been very slow, and in the census of 1910 somewhat less than one-third of the area of the county is reported as improved land.

The farms originally were very small, the settlers growing subsistence crops, mainly wheat, and some cotton as a money crop. Stock was kept, being pastured on the open range. Cotton and other products were marketed, after long hauls by wagon, at Tuscaloosa and Decatur, and later to some extent at Birmingham. With the advent of railroads, about 1887, greater attention was given to the growing of cotton, and considerable new land was taken under cultivation.

A mixed system of farming is still followed, with cotton as the money crop. The principal changes which have taken place have been an increase in the acreage of cotton and the introduction of commercial fertilizers. Wheat, even for home use, is not grown at present, and stock is no longer pastured on the open range. There has been, however, but little change in the methods of cultivation.

The 1910 census reports 12,970 acres in cotton in 1909, with a production of 4,757 bales. This crop is grown on practically all the farms and on all types of soil. The yields average from one-third to one-half bale per acre. The acreage of cotton is increasing.

Corn is the principal feed and forage crop. The census reports 30,999 acres in corn, with a production of 397,964 bushels, or an average of slightly less than 13 bushels per acre. The blades are commonly pulled for forage, and practically all the grain is consumed on the farms.

Oats are grown in a small way as a forage crop, only a negligible part being thrashed for the grain. Oats are reported on 4,384 acres in 1909, with a production of 39,241 bushels. Some sorghum and

cowpeas are grown for use on the farm. Cowpeas are reported in 1909 on 1,329 acres. There are a few small patches of rye, millet, and redtop. Bur clover as a winter pasture crop is grown in an experimental way. In the 1910 census tame or cultivated grasses are reported on 1,232 acres.

Sweet potatoes are grown, but only in a small way, although it is recognized by the farmers that there are large areas which are well adapted to this crop. Sweet potatoes are reported on 1,142 acres, and all other vegetables on a total of 1,140 acres, in the 1910 census.

The principal fruit grown in the county is the peach. There are a large number of small orchards on individual farms, but the commercial production of peaches is of little importance. Both the soil and topography throughout large sections of the county seem suitable for this fruit. The 1910 census reports 62,482 peach trees and 38,386 apple trees in the county.

Little attention is given to stock raising and dairying. A large number of farmers raise a few hogs for home use and keep a cow or two for the home supply of milk. The census of 1910 reports 475 calves, 3,542 other cattle, and 11,350 hogs sold or slaughtered in 1909.

There is but little recognition of the adaptation of the different soils to the staple or special crops grown. In general, however, the high ridges or plateaus are favored for peaches, and the superiority of the bottom-land or alluvial soils for corn is generally recognized.

The equipment of the average small farm consists of one or two 1-horse plows, a cotton and corn planter or a combined planter and fertilizer distributor, a cotton-stalk cutter, a harrow and drag, and generally one to three mules or horses for work animals. The barns usually are small. On many small farms corn is planted and the fertilizer distributed by hand.

It is a common practice to let cotton lands lie idle during the winter and to prepare the land in the spring simply by turning the last season's row into the old middle or water furrow. Oats commonly are sown broadcast in the spring, but where drilled in furrows they can safely be grown as a winter crop.

The depth of plowing is generally about 4 or 5 inches. Many of the more progressive farmers, however, use 2-horse plows, disk harrows, and other improved implements, break the land to greater depths, and follow with frequent and shallow cultivations. It is also considered good practice to protect the fields during the winter months by terracing and growing winter cover crops.

There is in general no definite or established system of crop rotation other than an occasional change from cotton to corn. In a few cases a rotation which includes a legume is used, and occasionally cowpeas are planted in corn or after oats, these crops being followed regularly with cotton.

Commercial fertilizers are in common use for both corn and cotton on all the soils except the more productive and durable bottom lands. Cotton ordinarily is fertilized with a 10–2–2 or a 10–3–3[1] mixture, at the rate of 200 to 300 pounds per acre.

The farming system is such that there is a small demand for farm labor. Some day labor is employed during cotton chopping and picking time and other busy seasons, the average wage being about $1 a day. The laborers generally prefer to work in the coal mines, and the small farms are operated by the farmers and their families.

The average size of the farms is reported in the 1910 census as 94.2 acres.[2] About one-half the area of the county is in farms, and of the farm land 30.5 per cent, or 28.7 acres per farm, is reported improved. About 71 per cent of the farms are operated by the owners, the remainder mainly by tenants. The share system of renting prevails.

The selling price of land varies from $5 an acre for the rougher, unimproved land to $40 an acre for the more desirable, improved farms. There is a large area of unimproved land suitable for general farming which has a selling price at present of $10 to $20 an acre. The average value of farm land is given in the 1910 census as $7.97 an acre.

SOILS.

Most of the soils of Walker County are residual in origin, being derived in place by weathering from the underlying rocks. A small part of the area of the county is made up of alluvial soils, which are composed of residual soil material or rock detritus which has been washed from lands within the drainage basins of the streams and redeposited in the flood plains along their courses. Some colluvial soil is found at the base of nearly every steep slope. Such soils, however, are not extensive in this area and are of little importance in comparison with the other two classes. They are composed of material which has been moved short distances from higher to lower topographic positions by gravity, aided by rainfall and other agencies. In this county the colluvial soils are mapped with the associated residual types.

Texturally silt loam soils predominate in the county, although there is a large total area of fine sandy loams and very fine sandy loams. Even the interstitial material of the gravelly loams and shale loams is very fine textured. It is especially noteworthy that there is very little deep sand or even deep sandy loam within the county, notwithstanding the fact that a large part of the soil material has been derived from sandstones.

The rocks from which the soils are derived consist predominantly of shales, with comparatively thin beds and formations of sandstone.

[1] Percentage of phosphoric acid, nitrogen, and potash.

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

So far as known there are no calcareous strata. The rocks occur in nearly horizontal beds, except in a small area in the extreme northeastern part of the county where there are noticeable dips. Owing to their horizontal position, relatively thin beds of sandstone may influence the soil over extensive areas. The shales are hard, rather coarsely laminated, and mainly siliceous rather than highly argillaceous. In their unaltered condition they are bluish black or grayish, but they weather to yellowish, brownish, and reddish colors. The sandstones are fine textured, and both massive and thinly bedded. They vary from light gray or pale yellowish to dark bluish gray, the decomposition material of the lighter colored rocks being yellow and that of the darker colored rocks red.

It is known that the strata are of Carboniferous age, and it is not improbable that they are in the main the equivalent of the Pottsville formation of the Pennsylvanian series.[1]

A few small areas of Coastal Plain deposits, which represent detached erosion remnants from the continuous areas to the west and south, exist in the western and northern parts of the county. The deposits are unconsolidated and consist of reddish or yellowish loam containing scattered, smooth pebbles and thin crusts of ferruginous sandstone.

There is a close relation between the rocks and soils of this county. The shales produce the silt loams and the sandstones give rise to the fine or very fine sandy loams. The color differences characterizing the two series which comprise most of the residual soils are essentially due to variations in the content of iron-bearing minerals in the rocks. The predominating fine texture of the soils results from the fine texture of the rocks. The texture, structure, and position of the rocks bear a close relation to the topography, and the topography in turn has a very important influence upon the agricultural value of the land. In fact, in Walker County probably the roughness or smoothness of the topography, wholly dependent upon the extent of stream erosion, has a more important influence upon the agricultural value of the land than does the nature of the rock or the lithologic character of the soils.

The alluvium along the local streams has been washed mainly from soils derived from the shales and sandstones of the Appalachian Plateau region, although along Mulberry Fork and Black Warrior River there has been some influence from materials derived from calcareous rocks, the headwaters of these streams lying in the Appalachian Valley region to the east. Thin terrace or second-

[1] The latest published studies of areal geology applicable to this county are found in the Birmingham Folio, No. 175, U. S. Geological Survey, by Charles Butts. A few square miles in the northeastern part of the county are within the limits of the Birmingham quadrangle.

bottom deposits of small extent occur along the large streams, representing old alluvial material no longer subject to overflow. The alluvial soils are mainly silt loams and fine sandy loams. In general, they are more productive and durable than the residual soils.

The soils are classed in series on the basis of origin, color, structure, and topography. The series are separated into soil types on the basis of texture. In Walker County 8 series, embracing 15 types, exclusive of Steep broken land, are recognized, one type being represented only by a shallow phase.

The residual soils, which occupy the greater part of the county, are classed with two series, the Dekalb and the Hanceville. The former is characterized by prevailingly grayish and yellowish surface soils and yellow subsoils, and the second by grayish to reddish-brown surface soils and prevailingly red subsoils. These soils are extensively developed throughout the upland section of the county. The topography varies from level, gently rolling, and rolling to steeply sloping.

The Hanceville soils, like the Dekalb, are derived from sandstones and shales. The subsoil color is the most apparent difference between the Hanceville and the Dekalb series, the two otherwise being closely associated and similar in origin and topography. The red color of the subsoils in contrast to the yellow of the Dekalb is believed to be due mainly to a relatively high content of iron-bearing minerals in the parent rocks, but in places may be due also to a topographic situation more favorable for complete oxidation. The Hanceville soils are generally regarded as having a slightly higher agricultural value than the corresponding types of the Dekalb.

The soils derived from the Coastal Plain deposits are classed with the Norfolk and Orangeburg series. The Norfolk series is represented only by the shallow phase of the loam type, which has a grayish surface soil and a yellow subsoil. The material is derived from remnants of Coastal Plain deposits, which occur as a thin veneer over the older sedimentary rocks of the Appalachian region along the inland margin of the Coastal Plain. There is characteristically some influence in the subsoil or immediate substrata from residual material from the older, underlying rocks. The topography is level to hilly. The Orangeburg series comprises Coastal Plain soil, having a grayish color at the surface and a red color in the subsoil, which is a friable sandy clay. The topography is level to hilly. The Orangeburg soil, the fine sandy loam, occurs in isolated areas throughout the higher parts of the county.

The alluvial soils of the first bottoms are classed with the Pope and Huntington series. The surface soils of the Pope series are grayish to brown and the subsoils brown to reddish brown. The color is lighter where the drainage is poor. This series comprises

material derived mainly from the sandstone and shale soils of this region. The surface soils of the Huntington series are light brown to brown and the subsoils yellow to brown. The soils are subject to overflow. The material represents wash from soils which are derived principally from limestone, sandstone, and shale. The differentiation of the Huntington and the Pope series is based chiefly on the source of the soil material, the presence of limestone material in the Huntington being the essential difference. The Huntington soils occur in this county along Mulberry Fork and Warrior River, the headwaters of which rise in part in areas of limestone, in the Appalachian Valley region to the eastward.

The small areas of soil occurring on alluvial terraces are classed with the Holston and Waynesboro series. The soil material here has been washed principally from other soils derived from sandstone and shale. The Holston series is represented by the fine sandy loam. This type has a grayish or yellowish to brownish color at the surface, and a yellow color in the subsoil. The Waynesboro series is also represented by a fine sandy loam. This type is characterized by a grayish to reddish-brown color in the surface soil and a red color in the subsoil, which in general is friable. In Walker County the Holston and Waynesboro soils evidently are composed of material which is quite similar in lithologic character and has the same source, the red color of the latter being due to better drainage and conditions more favorable for oxidation. In places the higher and older terraces have been subjected to long-continued stream erosion, so that the original nearly level terrace surface has been made rolling or hilly. In such situations cultivated fields generally are susceptible to washing and gullying.

Steep broken land consists of nonarable areas occurring along the larger streams as precipitous bluffs. These areas are forested, and, except for the meager pasturage they afford, have no agricultural value.

The following table gives the name and the actual and relative extent of each of the soil types mapped in Walker County:

Areas of different soils.

Soil.	Acres.	Per cent.	Soil.	Acres.	Per cent.
Dekalb very fine sandy loam...	139,264	27.3	Pope fine sandy loam.....	4,608	0.9
Dekalb shale loam.....	109,824	21.5	Holston fine sandy loam.....	3,200	.6
Hanceville silt loam.....	72,896	14.3	Huntington fine sandy loam....	2,944	.6
Dekalb silt loam.....	56,064	11.0	Norfolk loam, shallow phase....	2,560	.5
Steep broken land.....	50,304	9.8	Orangeburg fine sandy loam....	1,536	.3
Hanceville fine sandy loam.....	27,520	5.4			
Hanceville gravelly loam.....	24,960	4.9	Total.....	510,720	.....
Pope silt loam.....	15,040	2.9			

DEKALB VERY FINE SANDY LOAM.

The Dekalb very fine sandy loam typically consists of a grayish to pale-yellowish, friable, rather heavy very fine sandy loam, underlain at about 6 to 20 inches by yellow, compact clay loam to clay. Generally the surface material is a gray very fine sandy loam to a depth of 3 to 6 inches, grading into pale-yellowish very fine sandy loam, which in turn grades into bright-yellow or brownish-yellow silty clay loam and in places into clay. There is commonly a gradual increase in the silt and clay content with depth. The subsoil is compact, but rather friable and nowhere decidedly plastic. At a depth of 3 to 4 feet the residual material becomes more friable or crumbly in structure, grading into hard sandstone rock at 6 to 8 feet. In many places a reddish color is present in the lower subsoil or immediate substratum. The surface soil when moist has a deceptive coarse feel, and in cultivated fields develops a quite friable structure. When examined closely, however, the soil particles are found to be very fine sand, silt, and clay with only a small percentage of medium or coarse sand, the silt content averaging unusually high for a very fine sandy loam. In many places, however, considerable fine angular gravel is present, giving the material a more open structure.

On the steeper slopes, or in the rougher areas along the larger stream courses, the subsoil is commonly more open structured, owing to the presence of coarse rock fragments, and the bedrock is encountered at less depth than usual. Outcrops of massive-bedded sandstone are common along the streams. Small areas of Dekalb gravelly loam and stony loam are included with this type, occurring on the steeper slopes. As mapped, the type includes also small areas of the Dekalb fine sandy loam and silt loam. There is a gradation between the coarser variation of the Dekalb silt loam and the very fine sandy loam, and it is difficult in places to draw accurate boundaries between the two, especially as there is very little difference in the topography.

The Dekalb very fine sandy loam is the predominant soil of the northern and northeastern parts of the county, and is one of the most important soils mapped. It is most extensively developed north of Jasper in the vicinity of Manchester, Marylee, and Powellville. Large areas occur also in the extreme eastern part of the county near Quinton, Bryan, Democrat, and Empire.

The topography is generally undulating or slightly hilly. The surface is less dissected than in areas of the Dekalb shale loam and the Hanceville soils in the central and southern parts of the county. The larger streams, however, have cut deep, gorgelike channels, and the valley slopes in many places are steep and rough. Such steep

land is of much lower agricultural value than the prevailing soil, but forms only a small part of the total area of the type. Drainage is in general good.

The difference in texture between this type and the Dekalb silt loam is due mainly to the differences in lithologic character of the parent rock, but partly to differences in topography. The very fine sandy loam is derived from the weathering of the coarser, more massive bedded sandstones, while the silt loam is derived from argillaceous shales and thin, shaly sandstones. The prevailing yellow color of the soil, in contrast to the red color in the corresponding type of the Hanceville series, which also is derived from the sandstone members of the Coal Measures strata, is believed to be due to a lower content of iron-bearing minerals in the parent rock.

The Dekalb very fine sandy loam is regarded as one of the more arable and more desirable general-farming soils of the county, although hardly more than 20 per cent of its area has been cleared and placed under cultivation. The forest in the areas near Manchester, Marylee, and Powellville is mainly an open growth of longleaf yellow pine, with a scattering growth of hickory and oak. In other areas there is a thicker growth of mixed shortleaf pine and hardwoods, principally oak.

Cotton and corn are the principal crops grown, although the soil is known to be adapted to a variety of other crops. Cowpeas, oats, sorghum, peanuts, and sweet potatoes are grown in a small way. Under the prevailing methods of farming the yields of cotton range from one-third to one-half bale per acre and of corn from 15 to 20 bushels.[1] In a few cases acreage yields of as much as 1 bale of cotton and 30 to 40 bushels of corn are reported. These latter yields are indicative of the possibilities on this type where careful farming is practiced. Under the present system of farming the use of commercial fertilizers is regarded as essential to the production of profitable yields.

Unimproved land of this type is valued at $15 to $20 an acre, exclusive of coal and valuable timberland, while much of the improved land is held at $30 to $40 an acre.

Because of the comparatively loose structure of the surface soil, the land is easily plowed and maintained in good tilth, and in this respect has some advantages over the silt loam types of this and the Hanceville series. In steeply sloping fields terracing is necessary to prevent destructive erosion. The more extensive growing of organic matter supplying crops, particularly the legumes, is essential to best results on this land. The type supports a good growth of native

[1] The yields given for this and other types are based on observations in the field and on information obtained from farmers.

grass and produces a wide variety of forage crops successfully, and apparently the raising of stock, especially beef cattle (if the cattle tick is eradicated) and possibly hogs and sheep, could be made an important industry.

DEKALB SHALE LOAM.

The surface soil of the Dekalb shale loam typically consists of about 4 to 8 inches of grayish-brown to pale-yellowish silt loam; the subsoil is typically a yellow silty clay loam to silty clay. This type is characterized by a large quantity of small, flat chips and blocks of shale in both the surface soil and subsoil, which materially influence its structure and crop adaptation. Generally a mass of disintegrated shale rock is encountered at depths of about 10 to 30 inches, and in many places on the steepest slopes there is only a very thin covering of silt loam or clay over the bedrock. The soil is deepest at the bases of slopes where there is some colluvial accumulation. This type as mapped includes unimportant areas of the Hanceville shale loam which can not be satisfactorily separated on account of their small size. Small patches of the Dekalb silt loam and Hanceville silt loam also are included throughout the whole area.

The Dekalb shale loam has a large total area. It occurs principally in the central part of the county in the vicinity of Carbon Hill, Jasper, Cordova, and Dora. The topography is hilly or ridgy and steeply sloping, this soil occurring mainly on steep slopes, while the level stream divides and smoother country are occupied by soils of the Hanceville series.

The typical soil is in general neither very productive nor durable, and, since much of the land is too steep for profitable cultivation, this type has a lower agricultural rank than any other soil in the county. Selected fields in the more arable sections have been made to produce fair yields of cotton, but the steeper slopes which have been cleared and placed under cultivation have deteriorated very rapidly through the removal of the fine soil material by erosion, the land becoming in a few years little more than a mass of shale fragments. Because of the loose, open structure, due to the presence of the shale fragments, difficulty is experienced in maintaining terraces. The small patches of other types included with this soil are, of course, of higher value.

It is estimated that about 15 per cent of this type is under cultivation. The virgin land is forested with a thick mixed growth of shortleaf pine and hardwoods consisting principally of post oak, white oak, Spanish oak, and hickory. On the steeper slopes where the soil is thinnest, the dominant tree growth is scrub or Jersey pine.

Unimproved land of this type is valued at about $5 to $10 an acre, the mineral rights being reserved.

Good pasturage is available in places, and the raising of beef cattle appears to be the most promising means of utilizing a large part of this land. The timber has only a comparatively small value.

DEKALB SILT LOAM.

The Dekalb silt loam has a gray to pale-yellowish silt loam surface soil, underlain at about 3 to 6 or 8 inches by yellow, more compact silt loam, which gradually passes into silty clay loam to silty clay. In places the subsoil shows mottlings of red, but the typical subsoil is yellow to a depth of at least 3 feet. Small fragments of shale or shaly sandstone commonly are present, especially in the lower subsoil. In places, representing simply the smoother or less broken land in areas of Dekalb shale loam, the subsoil contains a high percentage of shale fragments at depths of 30 inches to 3 feet, and frequently it shows reddish spots. The subsoil is generally compact, but it is nowhere decidedly stiff or plastic.

The material of this type is not uniform. A variation is encountered in which the soil is derived mainly from fine-grained shaly sandstone and siliceous shale, instead of the more argillaceous shales from which the typical soil is derived. The soil here contains more very fine sand, which imparts a slightly more open and loamy structure and perhaps influences the working quality of the land, yet it is silty enough to preserve the physical character typical of the Dekalb silt loam; that is, it compacts in uncultivated areas and plows up somewhat cloddy. In some included areas of small extent the soil is a very fine sandy loam. The more loamy and sandy variation is confined largely to the northern part of the county, or that section north of Carbon Hill, Jasper, and the Birmingham-Jasper road.

Owing to their small size, some areas of the Dekalb shale loam are included with the type, especially on slopes where erosion has been most active. There are also included patches of the Hanceville silt loam and a type intermediate between the typical Dekalb and Hanceville, having a reddish-yellow or dull-red color.

The Dekalb silt loam occurs mainly in the northern and eastern parts of the county. Some of the soil occurs on gentle slopes or flats along shallow drainage ways and represents in part material of colluvial origin.

The Dekalb silt loam, although of smaller extent than the other types of the Dekalb series, is one of the more valuable soils of the county. The entire area is capable of being placed under cultivation, although probably not more than 25 per cent of it has been

cleared. In the areas cultivated cotton and corn are the principal crops, with a small acreage devoted to oats, sorghum, and other minor crops for forage. Cotton is the money crop, while corn is grown chiefly for the work stock. The yields of cotton and corn probably are slightly lower than on the Hanceville silt loam. Much of the very fine sandy soil in the northern part of the county, however, seems to have about the same value for all the crops grown as the very fine sandy loam type of this series.

Generally the soil of this type is compact and shows a tendency to clod, so that more labor and heavier implements and teams are necessary to maintain the land in good tilth than on most of the other residual types of the county. The land ordinarily is plowed to a depth of about 4 or 5 inches in the preparation of the seed bed, and given shallow and frequent subsequent cultivation. The clean-cultivated crops are grown on ridges. This land has about the same selling price as the Dekalb very fine sandy loam. The land is in need of deeper plowing and the more general production of the legumes. The application of lime, at the rate of 1 ton of burned lime or 2 tons or more of ground limestone per acre, has proved very beneficial on this soil in many parts of the Appalachian region. The more extensive raising of beef cattle and hogs would apparently be profitable, especially on those farms including large forested tracts.

HANCEVILLE GRAVELLY LOAM.

The Hanceville gravelly loam consists of grayish to brown or slightly reddish brown or reddish-yellow loam to silt loam, underlain at about 6 to 10 inches by brick-red, friable silty clay loam, passing into red clay. The type is not uniform, as it has a varied topography and is derived from rocks of different lithologic character. In the smoother areas it has a darker color at the surface, being brown or dark reddish brown, and is more loamy or mellow in structure than the other types of the Hanceville series. The soil mantle is nearly everywhere rather shallow, a loose mass of disintegrated rock being commonly encountered at a depth of about 30 to 40 inches.

Fragments of sandstone and shale are everywhere sufficiently abundant to influence the structure of the soil. The gravel consists of angular fragments of the underlying rocks. Large, flat blocks of sandstone, 4 to 8 inches in length, are present in places, mainly in the northeastern part of the county, while in other sections, especially the extreme southern part of the county, the gravel consists predominantly of small, thick blocks of siliceous shale or shaly sandstone, and in many places the material approaches rather closely

the character of a shale loam. In only a few places are the rock fragments of such size as to interfere seriously with tillage. In fact, they are, in a measure, a protection against field erosion.

The gravelly character of the soil seems to be more a result of the topography than of the lithologic character of the underlying rock, since in level or less eroded areas rocks of the same lithologic character and with the same structure produce silt loams and very fine sandy loams comparatively free from fragments of gravel size.

The Hanceville gravelly loam is rather widely distributed through the eastern and southern parts of the county, occurring in close association with the silt loam and fine sandy loam types of this series. This type is developed mainly on slopes and in small areas about the heads of ravines, although there are a number of fairly level areas on narrow sandstone erosion benches at the bases of shale hills. Some of the slopes in the southern part of the county are quite steep, and it is questionable whether the land here could be profitably cultivated. The surface drainage of the type is good. The steeper slopes if cleared and placed in cultivation would doubtless become seriously eroded and gullied within a few years, unless carefully terraced.

Only a small part of this type is under cultivation. In the smoother areas, however, especially where the dark reddish brown loam prevails, it is regarded as a stronger and more durable soil than either the silt loam or very fine sandy loam, giving slightly higher yields of both cotton and corn. Only small areas of such soil, however, are available for cultivation.

The rougher and more remote areas of this type are valued at about $10 an acre, exclusive of rights to the underlying coal. The smoother and more arable areas have about the same value as the silt loam and very fine sandy loam types of this series.

In its improvement one of the principal needs of this type is organic matter, which can be supplied by growing and occasionally plowing under the legumes, such as cowpeas. It may prove most profitable to use this land for raising beef cattle or for dairying where conveniently located with reference to shipping points.

HANCEVILLE FINE SANDY LOAM.

The Hanceville fine sandy loam consists predominantly of 5 or 6 inches of grayish to pale-yellow fine sandy loam, underlain by yellowish, more compact fine sandy loam, and this at about 8 to 20 inches by dull-red or brick-red, friable fine sandy clay loam or clay. In places the surface material ranges to a very fine sandy loam, there being very little medium or coarse sand present. The surface color is generally gray. In many cultivated fields red spots occur where the original surface covering has been washed away. In uncleared

areas the soil is dark gray at the surface, owing to forest mold, this color grading downward through pale yellow and reddish yellow into a decided red. There is a gradual increase in the clay content to a depth of 3 to 4 feet, below which the material becomes more friable or mealy and passes into disintegrated sandstone.

This type as mapped includes patches of the Hanceville silt loam so intricately associated with the fine sandy loam that an accurate separation is not practicable on the scale of mapping employed in this survey. The fine sandy loam is derived from thin sandstone strata which are impure and noticeably fine grained, and wherever there is even a slight influence from shales the soil material closely approaches a silt loam in character.

This type is widely distributed through the central and southern parts of the county, but occurs in small areas. A few isolated bodies of small extent are found in association with the Dekalb very fine sandy loam in the northern part of the county.

The Hanceville fine sandy loam occurs principally on the high, level to undulating stream divides which are narrow and separated by deep, narrow valleys or stretches of broken country. Many small tracts are, therefore, difficult of access. Small areas occur also on the lower lying sandstone erosion benches or plateaus which are a common feature of the topography in the southern part of the county. Drainage is good.

Practically all the type in areas sufficiently large for a 1-horse farm has been cleared and placed under cultivation. Cotton and corn are the principal crops grown. The yields of cotton average nearly one-half bale, and of corn 15 to 20 bushels, per acre. Higher yields are common with the better farmers. Commercial fertilizers are used for both crops, 200 to 300 pounds per acre commonly being applied. In the deeper areas of this type peanuts and sweet potatoes give good results, and on most of the farms near markets, garden truck is grown in a small way. Both the topography and the soil seem well suited to the growing of peaches.

The Hanceville fine sandy loam is more easily tilled than the silt loam type, and generally is smoother and less subject to erosion. The surface soil is loose and friable, and the subsoil, although not particularly plastic, is compact and fine grained, and retains moisture fairly well. The soil is deficient in organic matter, and needs more attention to the growing of leguminous crops and the use of barnyard manure to maintain its productiveness.

HANCEVILLE LOAM.

The Hanceville loam is shown on the soil map by inclusion symbol in areas of the Hanceville gravelly loam. It consists typically of a brown to reddish-brown, mellow, silty loam, underlain at a

depth of about 6 to 10 inches by either dull brownish red or bright-red silty clay loam, passing into red clay of a rather stiff nature. In general the subsoil is slightly stiffer and more compact than that of the other Hanceville types. Fragments of shale and sandstone generally are present in small quantities at the surface, and shale or sandstone rock commonly is encountered at depths of 30 inches to 4 feet.

The total area of this type is small. It occurs in widely separated bodies, none of which is more than 100 acres in extent, throughout the central and southern parts of the county in close association with the Hanceville silt loam and gravelly loam. The topography is level to gently undulating, the soil occurring at the bases of slopes or in very shallow sags.

This type probably owes its peculiar loamy texture and structure both to a topographic position which is favorable to the accumulation of considerable colluvial material and larger quantities of organic matter than in the case of other types of the series, and to the fact that its component mineral and rock particles are derived from both sandstone and shale.

The Hanceville loam is of little agricultural importance, because of its small extent, although it is one of the most productive soils of the county. A large part of the type is under cultivation. It is utilized principally for the production of cotton and corn, the yields of cotton being slightly higher than the average on other soils of the county.

HANCEVILLE SILT LOAM.

The Hanceville silt loam consists of a grayish silt loam, passing quickly into a yellowish silt loam, underlain at about 6 to 10 inches by red or reddish-yellow silty clay loam. This within a few inches grades into a compact reddish clay containing considerable yellowish weathered fragments of shale. Brownish and reddish, more loamy soils are encountered on the better drained colluvial slopes. Small fragments of shale and sandstone are rather abundant in the soil in many places, especially in the more hilly areas and on the steeper slopes. The subsoil as a rule is moderately friable or crumbly. Disintegrated shale rock generally is encountered at a depth of about 3 to 5 feet.

The type as mapped includes some areas of the Hanceville shale loam, particularly in the more broken or hilly sections of the county. This shale loam differs from the silt loam chiefly in the presence of a high percentage of small fragments of shale and shaly sandstone in the soil, producing a somewhat looser or more open structure. Except on colluvial slopes, bedrock is encountered in the more shaly areas at less than 3 feet. Owing to the small size and irregularity of the shale loam areas it is impractical to make any separation.

The Hanceville silt loam is one of the most extensive types mapped. It occurs principally in the central and southern parts of the county. It occupies both the high, level stream divides and the valley slopes, but generally occurs on the gentler slopes, the rougher land being occupied by the Dekalb shale loam and other types. The topography is rolling enough to provide good surface drainage, but the surface is nowhere too rough or steep for cultivation.

Practically all the broader, smoother areas of this type have been placed under cultivation and have proved fairly productive. It is estimated that about 40 per cent of the total area of the type has been cleared for farms.

Cotton and corn are the only important crops grown. The yield of cotton under the average farming methods is one-third to one-half bale per acre; the yields of corn probably average about 20 bushels per acre. These yields are commonly obtained with an acreage application of 200 to 300 pounds of commercial fertilizer, generally of 10–2–2 grade. Oats, cowpeas, and other crops are grown, but their acreage is comparatively small. Peaches do well, and there are small orchards on nearly every farm. In general this type is regarded as slightly more productive than the Dekalb silt loam.

The surface soil shows a slight tendency to clod, but a good tilth can easily be maintained. The subsoil retains moisture fairly well, and crops are seldom seriously injured by drought. Cultivated fields, however, are subject to destructive sheet erosion, and on the steeper slopes to gullying, and consequently deteriorate in a very few years unless preventive measures, such as terracing and the growing of winter cover crops, are adopted. The soil, even in the virgin condition, is apparently deficient in organic matter.

The selling price of land of this type varies from $10 an acre in the more remote parts of the county to $20 or $30 an acre in the more accessible areas. The prices are exclusive of the value of underlying coal deposits.

There apparently is no reason why this type could not be successfully used in the raising of beef cattle and for dairying, in favorable locations, provided the cattle tick is eradicated. The productiveness of the type could be maintained or increased most effectively by increasing the organic-matter content.

NORFOLK LOAM, SHALLOW PHASE.

The surface soil of the Norfolk loam, shallow phase, is a gray to pale-yellow, fine-textured loam, extending to a depth of 6 to 10 and in some places 15 inches. The underlying material is a yellow, compact silty clay loam, which grades into yellow or brownish-yellow clay of a moderately friable character. In some of the more nearly

level areas faint grayish mottling is observed in the subsoil. Yellowish and reddish residual material, derived from shales and sandstone, is commonly encountered at 2 to 4 feet. Smooth, waterworn quartz and quartzite gravel of small size is present, in sufficient quantity in spots to produce a loose, open structure at the surface, the soil of such areas consisting of a gravelly loam.

The Norfolk loam, shallow phase, is of small extent, and is confined principally to the extreme northwestern section of the county, near the Marion and Winston County lines. A few very small, isolated areas occur to the east. Many of these are too small for separate mapping and are included with the prevailing Dekalb types. The topography is level to undulating. The land for the most part lies at a somewhat lower elevation than the high ridges, which are capped with the Coastal Plain sediments giving rise to the Orangeburg soils. The natural drainage is fairly good, and is sufficient for the farming which prevails in this section of the country.

The greater part of this soil has been placed under cultivation. It is used chiefly for the production of corn and cotton. The land seems to have about the same agricultural value as the silt loam and very fine sandy loam types of the Dekalb series. Possibly in places it has a slightly higher value than those types.

The soil, except in the included gravelly patches, shows a slight tendency to become compact and clod, although no great difficulty is experienced in maintaining good tilth.

ORANGEBURG FINE SANDY LOAM.

The Orangeburg fine sandy loam is typically a grayish loamy fine sand to fine sandy loam about 6 to 8 inches deep, overlying yellow or reddish-yellow loamy fine sand to heavy fine sandy loam, which is underlain at about 12 to 20 inches by red, friable sandy clay. The soil as mapped is not entirely uniform in texture or color, but because of the small areas and slight agricultural importance of the Coastal Plain soils in this county fine distinctions are unimportant. A part of the type as mapped has a reddish-brown color in the subsoil, belonging more properly with the Ruston than with the Orangeburg series. In several places the soil contains a high percentage of smooth, waterworn quartz gravel, and flattish fragments of black or dark-red, highly ferruginous sandstone are abundant.

This soil occupies the highest ridges and caps the highest hills in a narrow belt of country along the Marion and Fayette County lines. A few small, isolated areas occur in the northern part of the county.

The Orangeburg fine sandy loam in this county is of very little agricultural importance because of its unfavorable topography and

the presence of large quantities of gravel and sandstone fragments. It is hardly representative, however, and elsewhere in the Coastal Plain it constitutes a valuable agricultural soil. Only a few of the more desirable patches are under cultivation, being utilized principally for cotton.

POPE FINE SANDY LOAM.

The surface soil of the Pope fine sandy loam consists of a grayish-brown to brown, loose, friable loamy fine sand to fine sandy loam. At a depth of 10 to 20 inches the material generally is a yellowish-brown silty clay loam or fine sandy loam. In many places along the larger streams there is little change in color or texture to a depth of 3 feet or more, the material being a dark-brown fine sandy loam.

The total area of this type is much smaller than that of the silt loam of this series. The largest area occurs along Sipsey Fork. The bottom land is ridgy and uneven, and is 25 to 40 feet above the normal level of the stream. Small areas occur in the bottom land of some of the minor streams, and small, scattered areas are mapped along various creeks in the southern part of the county. All the land is subject to overflow. Many narrow strips occurring on the banks of streams are included with the silt loam type.

Practically all of the Pope fine sandy loam is under cultivation. It is utilized principally for the production of corn and forage crops, the yields being about the same as on the Pope silt loam. Because of the looser, more friable structure of the soil it is somewhat easier to handle than that type.

POPE SILT LOAM.

The Pope silt loam typically consists of a brown or light-brown silt loam, underlain at about 10 to 15 inches by light-brown or yellowish-brown, moderately compact silty clay loam. In the higher, better drained bottoms along the larger streams the subsoil frequently has a reddish-brown color and is somewhat more friable in structure than usual. On the other hand, in the lower and more poorly drained bottoms of the smaller streams, the subsoil is a stiff silty clay loam or clay, with a yellow or mottled gray and yellow color. These more poorly drained areas represent inclusions of Atkins silt loam[1] or a close approach to that type. Very narrow strips of fine sandy loam or very fine sandy loam, occurring on the banks of the streams, are included with areas of the silt loam. The alluvium is commonly uniform in texture and free from any considerable amount of gravel or stones.

[1] The Atkins is the imperfectly drained, lighter colored equivalent of the Pope series.

This type constitutes the greater part of the alluvial soil of the county, excepting that along Mulberry Fork. The bottom land is for the most part 5 to 15 feet above the stream levels and is subject to frequent overflow. The land generally is quite level. A large part of the type is naturally poorly drained, and ditching is necessary before it can be profitably cultivated.

The Pope silt loam is a very productive and durable soil, and the greater part has been cleared and placed in cultivation. It is utilized chiefly for the production of corn and forage crops. Some cotton is grown; where the common upland varieties are planted, a heavy stalk is produced, but the plant frequently does not fruit so well as on the upland, and when the crop is late the top bolls often fail to mature. The yields of corn average 30 to 40 bushels per acre. Commercial fertilizer is not commonly used.

The heavier soil tends to compact and clod, and the use of disk harrows and drags or rollers is necessary to effect a good tilth, but on the whole no great difficulty is experienced in handling soil of this type. This land is valued at approximately $40 to $50 an acre.

HUNTINGTON FINE SANDY LOAM.

The surface soil of the Huntington fine sandy loam prevailingly is a brown, friable fine sandy loam or loamy, incoherent fine sand, extending to a depth of about 12 to 20 inches. The subsoil material generally is a yellowish-brown, moderately compact fine sandy loam which grades into clay loam. In places in the better drained bottoms it is reddish brown. There is no sharp line of separation between the soil and subsoil, and in many places there is little or no change in texture or color to a depth of 3 feet or more.

Several areas of Huntington fine sand, which occur in very narrow strips or as natural levees along the banks of the river, are included with this type, being too narrow for separate mapping. In such places the soil is a grayish to light-brown, loose fine sand, underlain by yellowish or light-brownish fine sand.

The Huntington fine sandy loam is confined almost entirely to the bottom lands along Mulberry Fork. Some small areas occur above Phillips Ferry, but these are included with the silt loam type. The bottoms along the upper part of the river are 25 to 40 feet above normal water level, but in the southern part of the county they are only a few feet above stream level or are entirely inundated, owing to the recent construction of a Government dam to render the river navigable. The bottom land is very narrow, being on the average not more than 100 to 200 yards in width on each side of the stream. It is not entirely level or smooth, but is marked by low ridges or hummocks and intervening sags. The natural drainage of the land along the upper part of the river is sufficient for the needs of farming.

This type is utilized principally for growing corn and forage crops. Yields of corn are probably about 30 to 40 bushels per acre. Fertilizers are not commonly used. The soil has proved to be very durable and productive and all the type has been under cultivation for a number of years.

Because of the light texture and loose, open structure of the surface soil the land is easily plowed and maintained in good tilth. Moisture conditions in the subsoil are good, and crops are seldom seriously injured by drought. This land is valued at about $40 per acre.

HUNTINGTON SILT LOAM.

The Huntington silt loam is shown on the soil map by inclusion symbol in Huntington fine sandy loam color. The type prevailingly is a brown, mellow silt loam which grades at about 12 to 18 inches into a light-brown or yellowish-brown, moderately compact silty clay loam. There is no sharp line of demarcation between the soil and subsoil, and in many places there is only a slight change in texture or color within the 3-foot section. The land is almost entirely free from waterworn gravel or other coarse rock fragments. A very thin layer of gravel generally occurs at the base of the alluvium, but at such depth as to have no material effect on crop production. The soil is not uniformly silty in texture, narrow strips of fine sandy loam occurring on the banks of the streams. In the higher, better drained bottoms the subsoil has in spots a decided reddish-brown color.

This type is confined principally to the bottoms along Mulberry Fork of the Black Warrior River, above Phillips Ferry. Small areas occur elsewhere in the bottoms throughout the course of this stream in this county, but these, because of their small extent, are included with the fine sandy loam type. The bottoms are 25 to 40 feet above normal river level, and the surface is fairly well drained. The bottoms along Mulberry Fork reach a maximum width of three-fourths mile, but the average width is hardly more than 200 yards.

Practically all the type is under cultivation. This soil and the fine sandy loam are regarded as the most durable and productive soils of the county, being especially valued for corn. The average yields of corn are probably between 35 and 40 bushels per acre, although exceptional yields of 50 to 60 bushels are reported. Some cotton is grown on the higher bottoms with satisfactory yields, although most farmers prefer to utilize their bottom land entirely for corn and forage crops. Crops generally are grown without the use of commercial fertilizers. Much of this land has been cropped continuously for a period of 25 years or more to corn, and is still producing fair yields.

With careful methods of tillage, little difficulty is experienced in keeping the land in good tilth. The bottoms are subject to overflow, but much less damage results to crops from this cause than along the smaller streams of the county. Land of this type is valued at $40 to $50 an acre.

HOLSTON FINE SANDY LOAM.

The surface soil of the Holston fine sandy loam prevailingly is a grayish-brown to yellowish fine sandy loam, rather compact in structure. This is underlain at about 8 to 12 inches by yellow, friable sandy clay loam to compact silty clay loam, passing into sandy clay or silty clay. In many places reddish mottling appears at a depth of about 3 feet. The surface soil is generally light gray when dry. Small areas of grayish, compact silt loam are included in the broader, more nearly level tracts. Small waterworn pebbles are present in places and produce a gravelly loam, but this type is not in large enough areas to be shown separately on the soil map.

The type is of only local importance, the total area being only 3,200 acres. It occurs on nearly level terraces, mainly along Lost and Blackwater Creeks, and lies 15 to 30 feet above the first bottoms of the streams. The drainage is fairly good, excepting in a few small spots in the more nearly level tracts.

All the land is under cultivation and the soil is generally considered as having a fair agricultural value. Cotton is the principal crop grown, although some corn is produced for use on the farm.

WAYNESBORO FINE SANDY LOAM.

The Waynesboro fine sandy loam is indicated on the soil map in areas of the Holston fine sandy loam by inclusion symbol. It consists of a grayish to reddish-brown, friable fine sandy loam, underlain at about 6 to 12 inches by red, moderately friable sandy clay. The material generally is free from any large quantity of gravel.

This type is of small extent. It occupies second bottoms along the Mulberry Fork of Warrior River, which occur at two different general levels, the lower terrace being approximately 20 to 30 feet and the higher 75 to 100 feet, above the first bottoms. The surface is level to undulating, and the natural drainage is good.

The terraces were doubtless originally of much greater extent and continuity, but have been so affected by stream erosion that only small areas remain.

This soil is more productive than the Holston fine sandy loam and is well suited to general farming. The land when cleared, however, is very susceptible to erosion and gullying on slopes and soon deteriorates unless properly terraced or otherwise protected. Cotton and corn are the chief crops grown.

STEEP BROKEN LAND.

Steep broken land is of little or no agricultural value. Much of this land occurs along the larger streams as precipitous bluffs. In some sections immediately adjoining the Warrior River, Mulberry Fork, and Wolf and Lost Creeks, in the southern part of the county, the areas which have been most minutely and deeply dissected by tributary streams are included in this classification. The greater part of the Steep broken land has a soil covering and supports a forest growth. Some areas afford fair pasturage.

SUMMARY.

Walker County is in the northwestern part of Alabama. It has an area of 798 square miles, or 510,720 acres.

Physiographically the region is a plateau, with an elevation ranging from about 500 to nearly 700 feet above sea level. The surface is prevailingly undulating to hilly, with small areas of extremely rough and broken country. In all parts of the county the natural surface drainage is adequate for agricultural purposes.

The population of the county is reported in the 1910 census as 37,013, of which about 93 per cent is rural. Jasper, the county seat, has a population of 2,509.

The lines of two railways pass through the central and northern parts of the county and afford good transportation facilities for the greater part of its area.

The climate is mild and healthful. The mean annual temperature is about 61° F. The mean annual precipitation is about 53 inches. There is a normal growing season of 200 days.

A system of general farming is practiced, with cotton as the chief money crop. Corn is the chief grain and forage crop. A small acreage is devoted to oats, cowpeas, and sorghum. Little attention is given to following the adaptation of the various soils to certain crops. There is no definite system of crop rotation, but cotton and corn occasionally are alternated. Commercial fertilizers are in general use for the corn and cotton crops.

According to the 1910 census, 50.3 per cent of the area of the county is in farms, and 30.5 per cent of the farm land is classed as improved. The average size of the farms is 94.2 acres. There is little demand for farm labor, nearly three-fourths of the farms being operated by the owners.

The soils of the greater part of the county are residual in origin, and are derived from shales and fine-grained sandstones. The silt loam and fine sandy loam types of soil predominate. The soils are generally well drained and easily tilled. The residual, or upland, soils are classed with two series—the Dekalb, characterized by gray-

ish to yellowish surface soils and yellow subsoils, and the Hanceville, with grayish to reddish-brown surface soils and prevailingly red subsoils.

Small developments of Norfolk and Orangeburg soils, of Coastal Plain origin, are mapped.

The bottom-land or alluvial soils cover only a small part of the county. They are classed with four series—the Pope, Huntington, Holston, and Waynesboro, the latter two series representing old alluvial terrace soils. The alluvial soils are mainly composed of silt loam and fine sandy loam, and are the most productive and durable soils of the county.

The soils, in general, seem to be deficient in organic matter, and in order to maintain the productiveness of the land organic matter must be added, either in the form of manure or green crops turned under. There is considerable loss through washing where steep slopes are cultivated without terracing or employing other preventive means.

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[PUBLIC RESOLUTION—No. 9.]

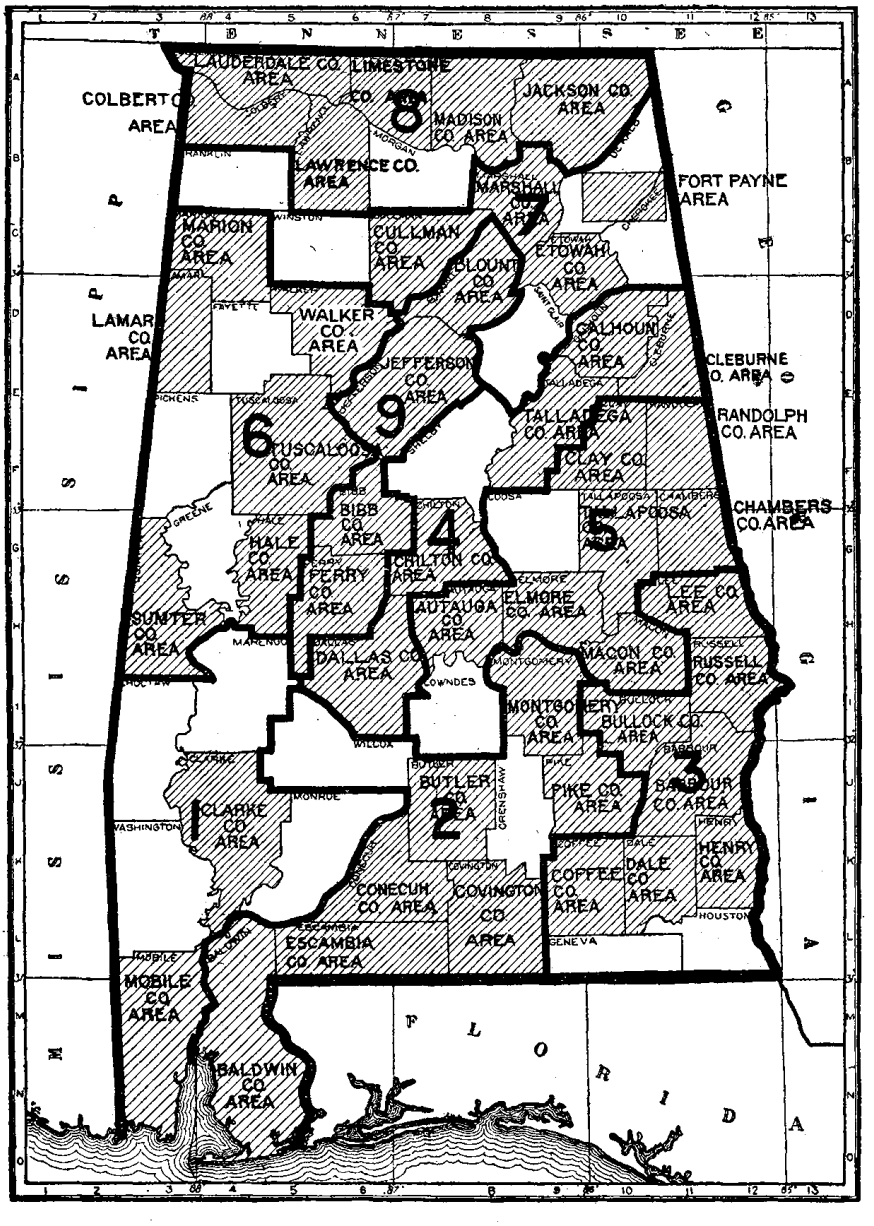
JOINT RESOLUTION Amending public resolution numbered eight, Fifty-sixth Congress, second session, approved February twenty-third, nineteen hundred and one, "providing for the printing annually of the report on field operations of the Division of Soils, Department of Agriculture."

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.]



Areas surveyed in Alabama.

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