Issued December 31, 1914.

U. S. DEPARTMENT OF AGRICULTURE,

BUREAU OF SOILS—MILTON WHITNEY, Chief.

IN COOPERATION WITH THE GEORGIA STATE COLLEGE OF AGRICULTURE,
ANDREW M. SOULE, PRESIDENT; DAVID D. LONG,
IN CHARGE SOIL SURVEY.

SOIL SURVEY OF JONES COUNTY, GEORGIA.

BY

DAVID D. LONG, OF THE GEORGIA STATE COLLEGE OF AGRICULTURE, AND G. A. CRABB, L. L. BRINKLEY, RISDEN T. ALLEN, AND E. J. GRIMES, OF THE U. S. DEPARTMENT OF AGRICULTURE.

W. EDWARD HEARN, INSPECTOR, SOUTHERN DIVISION.

[Advance Sheets—Field Operations of the Bureau of Soils, 1913.]

WASHINGTON:
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1914.

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LETTER OF TRANSMITTAL.

U. S. DEPARTMENT OF AGRICULTURE,
BUREAU OF SOILS,
Washington, D. C., May 6, 1914.

SIR: The accompanying report and soil map cover the survey of Jones County, Ga., one of the projects undertaken by the bureau during the field season of 1913. This work was done in cooperation with the Georgia State College of Agriculture, 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 area, and to recommend their publication as advance sheets of Field Operations of the Bureau of Soils for 1913, as provided by law.

Respectfully,

MILTON WHITNEY,
Chief of Bureau.

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

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Soil map, Jones County sheet, Georgia.

SOIL SURVEY OF JONES COUNTY, GEORGIA.

By DAVID D. LONG, of the Georgia State College of Agriculture, and G. A. CRABB, L. L. BRINKLEY, RISDEN T. ALLEN, and E. J. GRIMES, of the U. S. Department of Agriculture.

DESCRIPTION OF THE AREA.

Jones County, Georgia, is situated at about the geographical center of the State, the southern boundary lying 5 miles from Macon. On the north the county joins Jasper and Putnam Counties, on the east Baldwin County, and on the south Wilkinson, Twiggs, and Bibb

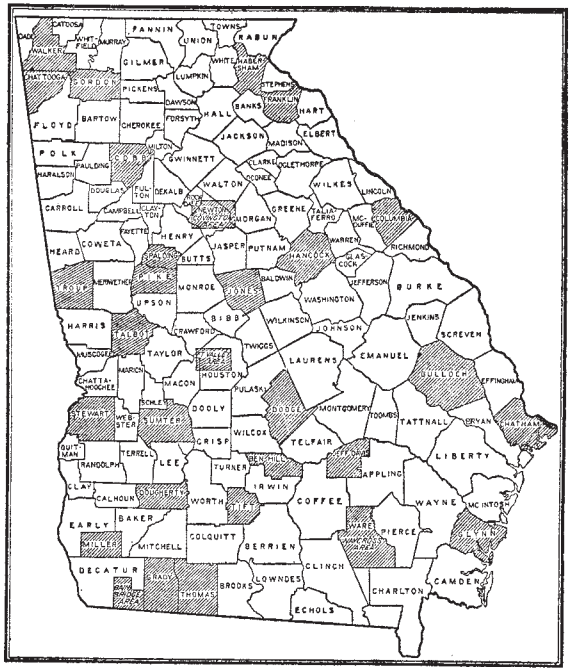

FIG. 1.—Sketch map showing areas surveyed in Georgia.

Counties. The Ocmulgee River separates it from Monroe County on the west. The boundary lines, with the exception of the Ocmulgee River, are the subject of dispute and can not be exactly determined at present. Those shown on the soil map are drawn according to local information. The greatest distance across the county from north to

south is about 22 miles and from east to west about 20 miles. The county embraces an area of 401 square miles, or 256,640 acres.

Jones County lies along the line of contact between the physiographic provinces known as the Piedmont Plateau and the Atlantic Coastal Plain, about one-fifth of it being within the latter. The line dividing the two provinces is rather distinct, although irregular fingers or extensions occur along the eastern edge of the county. A line drawn from the Baldwin County line a few miles south of Haddock in a south of west direction to the junction of Dry Bone Creek and the Bibb County line would practically represent the boundary between the two divisions. Isolated areas of the Coastal Plain occur between Gray and Haddock in the form of ridges lying higher than the surrounding Piedmont country.

In its surface configuration Jones County varies from smooth, gently rolling stream divides to rough and hilly or broken sections. The Coastal Plain region is characterized by a few level or flat interstream areas, while in the other portions the divides present a rather rolling surface. There are no large, smooth areas of level land, such as typify the Coastal Plain in the southern part of the State. The streams and their tributaries have cut deeply into the surface, which gives a generally rolling topography.

In the Piedmont section along the divide between Commissioner Creek and the Ocmulgee River, which is represented by the line of the Athens branch of the Central of Georgia Railway, the topography is smooth to gently rolling. As the eastern boundary of the county is approached the topography becomes more dissected and rolling, with many hills, especially along the small streams. In the western part of the county, toward the Ocmulgee River, the surface is marked by steep hills and deep ravines along the stream courses, with a few small, level areas along the streams and on the crests of the ridges. The topography here is generally very rolling and hilly to rough and broken. This condition is due to the large number of streams which have cut deeply into the surface in flowing toward the river. Almost all the streams have small, narrow strips of level land along their courses, which may be flanked on one or both sides by steep, blufflike rises. Farther away from the streams the contours are somewhat more even, especially in the central part of the county. In many cases streams have their sources in deep gullies.

The drainage of the county is about equally divided between the Ocmulgee River system on the west and the Oconee River system on the east. The Athens branch of the Central of Georgia Railway follows the line of division between the two drainage systems. Caney Creek and its tributaries, chief among which are Rock and Falling Creeks, drain the northwestern part of the county. The sec-

ond main tributary of the Ocmulgee River is Walnut Creek, which, with its tributaries, chief among which are Sand and Bonner Creeks, drains the southwestern portion. The waters of the northeastern section of the county drain to the north and northeast and are carried to the Oconee River by Big Cedar and Little Cedar Creeks and their tributaries. The southeastern part of the county slopes to the southeast and is drained by Commissioner, Slash, and Sandy Creeks and their tributaries.

The area now embraced in Jones County was originally a part of Baldwin County, the separation having been made in 1807. Some territory from Putnam County was added to Jones in 1810 and a part taken off in the formation of Bibb County in 1822. Settlement began when the county was originally laid off and opened for settlement by the State in 1806. The land lots were given away by lottery to induce settlers from other parts of the State to settle in this section. Within a few years all the lots were taken. The first settlements were made in the northern part of the county in the vicinity of Round Oak, and in the northeastern section. The early settlers were of Scotch-Irish descent. Population increased rapidly until about 1835, when the county stood third or fourth in point of agricultural wealth among the counties of the State. About this time, owing to damage to their fields by erosion and lack of capital to develop their property, many farmers left to take up lands opened in other parts of the State. According to the census of 1850, the population of the county was 10,224, of which 6,325 were negroes. The Thirteenth Census gives the population as 13,103, which is a slight decrease from the figures for 1900 and a slight increase over those for 1890.

The county is sparsely settled; the density of population is 3.26 per square mile. According to the census of 1910, it possesses no towns having over 350 inhabitants. Gray, the county seat, is a small town on the Athens branch of the Central of Georgia Railway, about 18 miles from Macon. Clinton is the oldest settlement in this section of the State, having been of considerable importance as a trading point during the first half of the nineteenth century. It was the county seat until 1907. Haddock, a town of 312 inhabitants, is an important trading point for the eastern part of the county. Other small settlements and shipping points are Wayside, Round Oak, Bradley, James, and Griswoldville.

The county possesses excellent transportation facilities, no part of it being any considerable distance from a railroad point. The Athens branch of the Central of Georgia Railway is the most important commercial line, as it serves the most important agricul-

tural part of the county. The main line of this road traverses the southern extremity of the county for a distance of several miles. The Southern Railway, although it runs on the opposite side of the Ocmulgee River, indirectly serves the people of Jones County.

The county possesses a large mileage of dirt roads, which are in fair condition during good seasons, but become very heavy and almost impassable in some places during the winter months.

CLIMATE.

The climate of Jones County is characterized by long, hot summers and brief, mild winters. The mean temperature for the months of April and October is 63° F. and for June, July, and August 79.4° F. The hottest month, July, has a mean temperature of 80.8° F., an absolute maximum of 105° F., and an absolute minimum of 62° F.

The winters are not severe, the coldest and most disagreeable weather occurring in January and February, when the mean temperature is about 46° F. Snow is of infrequent occurrence and remains on the ground for a very short time. The hardy vegetables, such as cabbage, spinach, turnips, and onions, grow throughout the winter with little protection.

The period between the last killing frost in the spring and the first in the fall allows time for all crops to mature. The average date of the last killing frost in spring is March 22 and of the earliest in fall November 5, giving a growing season of about 8 months. The date of the latest recorded killing frost in spring is April 17 and of the earliest in the fall October 23.

Frosts occurring in the spring after a warm period during which the peach trees have blossomed, sometimes do considerable injury, but there has never been a complete failure of this fruit crop from this cause.

The mean annual rainfall of about 48 inches is fairly well distributed through the year, the fall months having less than the other seasons. The greatest rainfall occurs in the winter and summer months. The amount of precipitation in the spring is somewhat less, and in some years the rainfall is not sufficient to give the maximum growth of crops, but this is offset to some extent by the usual abundant precipitation during the summer.

The climate, on the whole, is as pleasant as that of any other part of the State and the county is a desirable residential section.

The following figures give the normal monthly, seasonal, and annual temperature and precipitation at Milledgeville, in the adjoining county of Baldwin. These figures are believed to represent with sufficient accuracy the conditions in Jones County.

Normal monthly, seasonal, and annual temperature and precipitation at Milledgeville, Baldwin County, Ga.

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	46.5	75	10	4.13	4.39	5.60
January	44.0	77	6	4.18	2.25	6.30
February	48.2	79	9	5.17	3.63	6.34
Winter	46.2	.....	.....	13.48	10.27	18.24
March	55.4	90	20	5.33	1.25	10.80
April	63.6	92	29	2.66	1.09	0.99
May	71.8	98	39	3.31	2.51	5.88
Spring	63.6	.....	.....	11.30	4.85	17.67
June	78.1	100	46	4.12	0.79	2.66
July	80.8	105	62	5.18	2.81	4.44
August	79.3	100	58	5.27	6.89	2.60
Summer	79.4	.....	.....	14.57	10.49	9.70
September	74.6	100	43	3.84	T.	11.00
October	63.0	94	29	2.22	0.69	6.16
November	53.5	82	19	2.36	2.70	4.41
Fall	63.7	.....	.....	8.42	3.39	21.57
Year	63.2	105	6	47.77	29.00	67.18

AGRICULTURE.

The early settlers of the territory now embraced in Jones County grew only such crops as were needed for home consumption. Corn, wheat, oats, rye, barley, tobacco, and fruits were the first crops. Stock raising received considerable attention, sheep being raised for wool for home use, cattle for hides and beef, hogs for food, and horses for work stock. Cotton attained a prominent place in the agriculture of the county in the early part of the nineteenth century, after the invention of the cotton gin, but did not become an important money crop until after the Civil War.

During the early stages of development Augusta was the first important market, the farm products being hauled there by wagon, a distance of 140 miles. Cotton later was shipped to Darien on flat boats, and at a still later date Macon became the principal market. The building of what is now the Central of Georgia Railway in 1886 advanced the price of land and hastened the development of

the county by encouraging settlement and lessening the cost of marketing the products. The development of the system of agriculture existing to-day is the outgrowth of the demand for a money crop immediately after the Civil War. At present cotton and corn are the chief products, there being but a very small acreage devoted to the small grains. Peaches form a special industry, from which a large revenue is received.

Cotton is the most important money crop of the county. Under the prevailing tenant system there are fields that have been devoted to the continuous production of this crop for the last 60 years. Tenants plant little else. According to the Thirteenth Census there were 48,520 acres in cotton in 1909, producing 17,391 bales, or an average of 0.35 bale per acre. The acreage in this crop is about 44 per cent of the improved land of the county. The average annual production is about 15,000 bales, which could be materially increased by the proper utilization and handling of the soils.

The most common method of preparing the land for cotton is to plow up the stalks and list on the beds. The middles are then broken out and the seed planted on the same bed as the year before. Where the fertilizer is applied in one application it is generally distributed along the rows before the soil is listed back on the old bed. A better method practiced by a few progressive farmers consists of breaking the land deeply with 2-horse or disk plows in the fall or spring, after which it is well harrowed and leveled. The rows are then laid off by plowing out a furrow, into which the fertilizer is distributed.

The crop is generally planted between the first of April and the first of May. As a rule the rows are 3½ to 4 feet apart, while in chopping out a distance of 12 to 18 inches is allowed between the plants in the row. Where the land is well prepared and the crop highly fertilized the distance is somewhat increased, the maximum distance between the rows being 6 feet. The cultivation of the cotton begins as soon as the plants are well above the ground. The first operation is to run close to the rows on both sides of the cotton with a small plow which throws the soil away from the row. This operation is termed "barring off" and is done to facilitate the thinning or chopping out of the cotton. The chopping is done with hand hoes. Succeeding operations consist of turning the soil back to the cotton rows by the use of a sweep or scrape. As the crop advances the middles of the rows are plowed in the same way, which is locally called "siding" the cotton. Some of the best farmers omit the process of "barring off" and instead of this operation "side" with a sweep. The number of cultivations given cotton varies from three to six, with an average probably of four. Frequent and shallow cultivation in order to keep a fine

mulch on the surface is highly advantageous. Improved cultivators are not used to any extent in working cotton in this county. In too many cases the farmers "lay by" the crop too early in the season. Later cultivations have been found to be very beneficial.

In the use of commercial fertilizers there is a decided lack of uniformity. The quantity applied ranges from 100 to 600 pounds per acre. Most of the tenants apply about 150 to 200 pounds per acre. The more progressive farmers use from 300 to 500 pounds. The different grades carry from 8 to 10 per cent of phosphoric acid, 2 to 4 per cent of nitrogen, and 2 to 5 per cent of potash. Mixtures of 10–2–2, 9–3–3, or 8–2–2 formulas are generally used. The use of the higher grade mixtures and of larger applications is becoming more general. The common method is to apply all the fertilizer at the time of planting. A few farmers are making side applications of nitrate of soda.

It can not be said that any particular variety of cotton is a general favorite throughout the county. Many farmers do not know the variety of seed that they are using, as it is secured from the general run at the gin. Among the varieties used are the Toole, King, Cleveland Big Boll, Mortgage Lifter, Christopher, Union Big Boll, and Cook's Prolific. The Dixie, an improved variety, seems especially adapted to the soils of the greater part of the county.

Although corn ranks second to cotton in importance, there is not enough of it grown at the present time to supply local needs, the farmers giving their attention principally to cotton. One of the largest corn crops was that of 1859, when 321,200 bushels were secured. In 1869 the production had dwindled to 105,945 bushels. The acreage devoted to the crop in 1909 was 26,685 acres, producing 261,708 bushels. On a basis of the census returns the yield per acre of corn has averaged less than 12 bushels. With proper management this could be increased to 40 or 50 bushels or more per acre.

The prevailing method of planting corn is to plow a furrow with a "middle buster" and drop the seed therein by hand. The rows are generally laid off 4 to 6 feet apart, while the hills in the rows are usually 18 to 36 inches apart. By decreasing the distance between the rows and the hills and applying more commercial fertilizer or barnyard manure, with proper preparation of the land and cultivation of the crop, the yields are materially increased. The object in growing this crop is generally to produce simply a sufficient supply for home use. In this most of the tenants, as well as some of the better farmers, fail. The crop is cultivated less carefully than cotton, being given only two or three cultivations and then laid by. The corn is planted between March 5 and April 1. About August 1 to 20 the upper blades of the stalks are pulled and tied into bundles for

use as forage. A few farmers cut and shock the corn, and these use the entire stalk for feed.

Owing to the prevailing high price of corn, a few farmers, chiefly owners, are beginning to pay considerable attention to its production. Under better methods of cultivation the land is plowed or broken flat or broadcast with a 2-horse turning plow during the fall or winter. In the spring the land is harrowed and the soil well pulverized, making a good seed bed. The rows are laid off at the desired distance by running a furrow, into which the fertilizer is placed and the seed planted. Cultivation is done with improved cultivators in only a few instances. As in case of cotton, many farmers "lay by" the crop too early in the season. Over the greater part of the county the yield of corn per acre could be materially increased by systematic management, including the rotation of crops, deep fall plowing, the use of legumes, the selection of seed, and efficient cultivation.

The use of fertilizer on corn is not as common as on cotton, many tenants using none at all, others applying from 100 to 200 pounds of the same grades used on cotton. A different condition exists on the farms operated by the owners, large amounts of high-grade fertilizers being used. In some instances even a larger quantity is applied for corn than for cotton. The practice of applying fertilizers at several different times during the growing season is becoming more common. The fertilizers commonly used analyze from 8 to 10 per cent phosphoric acid, 2 to 4 per cent nitrogen, and 2 to 5 per cent potash. A side dressing of about 100 pounds of nitrate of soda per acre is applied about the time of last cultivation.

The varieties of corn in most common use are the Marlboro and the Hastings. The Morton, said to be a local variety, has been grown for a considerable length of time with good results. It is considered especially resistant to the attacks of the weevil. In the large acreage which is farmed by tenants little or no attention is paid to variety.

The oat crop has held a place of varying importance in the agriculture of the county. According to the census figures, there were 4,565 acres devoted to the crop in 1889 and 1,880 acres in 1909. In the latter year there were 29,209 bushels produced. The acreage is gradually increasing. The average yield per acre has steadily increased during the past 40 years from 4.7 to 15.5 bushels.

A large number of farmers sow oats broadcast and then plow the seed under with a small turning plow. This leaves the surface very irregular and somewhat clodded, which causes a rapid loss of moisture. The seed is also covered at irregular depths, some of it too deep. Some of the better farmers break the land broadcast and bring the seed bed into good tilth by harrowing, after which the seed is either harrowed under or drilled in with a grain drill. The seed is

generally sown during the months of October and November, and the crop harvested during the latter part of May or the early part of June. The crop is harvested usually with a mowing machine, though sometimes cradled, there being an insufficient acreage to warrant the use of reapers for this purpose. Much of the crop is cut and fed in the straw as forage and grain combined. Fertilizers are rarely used for oats, although it is not uncommon to apply a top dressing of nitrate of soda in the early spring. The Texas Rust Proof is the variety most commonly used. The Appler, Georgia Rust Proof, and Bancroft are also planted. The crop is generally sown on corn land.

Cowpeas are at present grown on only a few farms, but up-to-date farmers are beginning to appreciate their value as a soil renovator and forage crop. In 1909, according to the census reports, there were 561 acres devoted to this crop, which produced 3,527 bushels of dry peas.

When used as a hay crop the cowpeas are generally sown broadcast on oat-stubble land and turned under with a turning or disk plow. They are usually sown during the month of June or in the early part of July, and the hay is harvested in October. The yield varies from one-fourth to 1 ton or more. The average under the methods now generally employed is about one-half ton per acre. As a rule no fertilizer is applied to this crop.

It is a common practice to sow cowpeas in the cornland, either in a drill or broadcast between the rows at about the time of last cultivation. It is not the general practice to pick the seed from such plantings, but after the corn and fodder are pulled hogs are allowed to forage upon the vines and seed.

The Unknown, Whippoorwill, and Iron are the most commonly used varieties. The Iron cowpea is especially valuable, as it is resistant to wilt diseases. Many farmers do not know the varieties they plant.

In general, under existing methods the organic-matter content of practically all the soils has been depleted by the growing of clean culture crops continuously. By growing cowpeas the organic-matter supply is increased. In general, the value of this crop as a forage crop and as a soil improver is but little appreciated.

Wheat was produced successfully by the early settlers, but owing to the greater profit in growing cotton it has become a crop of very little importance. The census reports show a decrease of production from 19,085 bushels in 1859 to 557 in 1909. In the early days the product was milled and consumed at home. At present there are practically no flour mills in the county, and there is no inducement for the production of wheat. The ordinary yield is 8 or 9 bushels per acre. Larger yields can be secured under more efficient management.

On similar soils in other parts of the Piedmont 20 to 30 bushels per acre is not an uncommon yield, but where this is the case the climatic conditions are probably more favorable to this crop.

Rye has never been extensively produced in the county. It has been grown only in small, scattered areas. According to the census reports only 3 acres were devoted to this crop in 1909, with a production of 18 bushels.

For winter roughage for stock the greater number of farmers depend upon corn fodder, oats in the sheaf, and pea-vine hay. The wild grasses, such as crab and Bermuda, as well as Johnson grass, are also used to make hay. Sorghum is frequently sown broadcast and cut for forage. Lespedeza, or Japan clover, which is valuable for grazing, grows wild throughout the county. Bur clover also does well. At present there is not sufficient hay and forage produced in the county to supply local needs.

The production of peaches on a commercial basis has been very profitable, and the industry has become permanently established. The development of peach growing began about 1903, when a number of orchards of 5,000 to 10,000 trees were set out at Bradley, Round Oak, Morton, and Haddock. These were followed by other orchards, until at the present time there are about 4,000 acres, with about 500,000 trees, devoted to this crop. The orchards range in size from 5,000 to 15,000 trees. An average of practically 16 per cent of the State's crop has been produced in Jones County for the last five years. The average production is about 250 carloads a season, the smallest crop—50 carloads—being gathered in 1911, and the largest—450 carloads—in 1912.

The orchards of the county are located chiefly along the Athens branch of the Central of Georgia Railway, between Morton and Round Oak, and none of them lie at a greater distance than 3 miles from a shipping point. At James there is a large orchard. Most of the orchards are located on the Cecil clay and Cecil clay loam. There are a few on the Cecil sandy loam and small ones on some of the Coastal Plain types. It has been found that on the sandy lands the fruit generally matures and drops earlier in the season and that the trees are shorter lived. A disease locally known as "wart root" attacks the trees on the sandy soils. On the Cecil soils variations in the productiveness and general health of the trees are mainly the result of different methods of management. The well-cultivated, sprayed, and otherwise carefully managed orchards are the most thrifty and productive. Fruit from such orchards also stands shipping better and brings a better price than that from neglected orchards.

Since the establishment of the peach-growing industry in this county there has never been a total failure of the crop, although unfavorable climatic conditions at times curtail the yields.

In setting out the trees sites having the highest elevations and efficient drainage are selected. It is the general practice to set the trees out in November, although some orchards have been set in spring. Fall planting has been found the most successful by a majority of the growers. From 100 to 150 trees are set to the acre, depending upon the variety planted and the type of soil, the average being 125 trees. The trees make a larger growth on the clayey than on the sandy soils, and consequently are set farther apart on the former. The early maturing varieties do not attain as large a size as the later ones, such as the Elberta and Georgia Belle, and, therefore, more of them can be set to the acre. During the first and second years of growth cotton is planted between the rows.

The orchards are fertilized the first two years by applying a mixture of one-half pound of bone meal and 1 pound of cottonseed meal around each tree. Many trees have been killed by applying this fertilizer too close to the trunks, but the common practice now is to place it at a distance greater than 1½ feet. During the third year the orchards are harrowed frequently. The best orchards are remarkably free of weeds. The most successful growers attach a great deal of importance to frequent cultivation. All varieties except the Elberta begin bearing the third year. The latter does not bear profitably until the fourth or fifth year. The Carmen yields the most profit the third season. After the orchards have started bearing they are plowed and cultivated each season until the trees are too old for profitable yields. Some of the older orchards have produced large returns for 15 years or longer by good management.

The fruit is handled almost entirely by local labor, with the possible exception of the latter part of the season, when help is secured from other parts of the State. The yield ranges from 20 to 100 crates per acre, depending upon the cultural methods, the age of the trees, and the season.

As a rule each orchard contains a number of varieties. These different varieties come into bearing from June 1 until July 15, which enables the orchardists to handle the fruit with local labor and without loss through congestion of traffic.

There are six varieties upon which almost every grower depends. The Greensborough is the earliest maturing variety and stands fifth in extent of acreage. This peach is ready for market during the first week in June. The Arpbeauty is sixth in extent of production and is becoming a favorite as an early peach. This variety is ready for market about June 10. It has attracted the growers by

its good shipping qualities and the high price which it brings. The fruit is of golden-yellow color and has a delicious flavor. The trees are short lived.

The Carmen stands fourth in extent of acreage and third in time of ripening. This variety is ready for shipment about the middle of June and brings good prices. It bears heavily and is the best variety for early market.

The Huyley Belle or Early Belle is ready for market immediately after the Carmen, ripening about June 25. It is a popular peach and stands third in extent of acreage.

There are more trees of the Belle of Georgia than any other variety. Its color, size, and shipping qualities are good. It is ready for shipment about July 5.

The Elberta stands second to the Georgia Belle in point of acreage and is the latest shipping peach, being ready for market about July 15.

The peach industry is gradually increasing.

There is no systematic crop rotation practiced in the county. Cotton is grown by the tenants year after year upon the same land, being occasionally changed when it is desired to plant corn in a different field. The better farmers are beginning to realize the value of rotating the crops and are attempting to do so to a limited extent. The acreage devoted to the different crops is so disproportionate that it is difficult to change the fields every year or even every other year. Many fields have been planted to cotton successively for the past 40 or 50 years. This system has brought about the depletion of the fertility of the soils and has caused their physical nature to change by the withdrawal of the organic matter. While at first the clay lands were somewhat loose and mellow, they now have become hard and difficult to bring into good tilth. The disastrous results of erosion are also partly due to the lack of any systematic rotation. Where a rotation is followed, it usually consists of cotton preceding corn, the corn being followed by oats.

The use of commercial fertilizers naturally followed the single cropping system after the Civil War. Prior to that time no fertilizers were used. According to the census figures there was expended in the county in 1909 for fertilizers the sum of $111,842, an increase of nearly 300 per cent over the expenditure in 1899. The greater part of the fertilizers is purchased ready mixed. Better results are secured by those farmers using home-mixed fertilizers. The materials can be easily mixed on the farm during the winter months, and this practice is more economical. There is no definite system of applying fertilizers in the county. Generally the same grade of fertilizer is applied to all crops on all soils indiscriminately.

According to the census reports for 1910 the value of the live stock on farms was $545,500. The stock consists chiefly of work animals, of which the mule is the most common. The county does not produce sufficient cattle and hogs to supply the local consumption. Milch cows are found on some farms, but in many cases not even one cow is kept to supply milk and butter for the home. Pure-bred cattle are rarely seen.

The census of 1910 reports 216,153 acres in farms, of which 108,872 acres are classed as improved. The average size of the farms is 112.5 acres.[1] The proportion of farms operated by their owners is gradually decreasing. In 1910 the percentage was 21.5. It is remarkable that landed property is being gradually concentrated into fewer hands each year. At present about 50 persons own over half of the county, 34 persons having holdings of 1,000 acres or more. The range of holdings varies from a few acres to 12,800 acres. The large landowners have no desire to sell off any part of their lands, but, instead, endeavor to secure more. This condition prevents the development of the county to the greatest extent and is practically the underlying reason for its poor development at the present time.

SOILS.

Approximately 80 per cent of the area of Jones County lies in the Piedmont Plateau, and the remainder, or all of the southeastern corner, in the Coastal Plain, and the important soils of the county have been divided into groups according as they lie in one or the other of these regions.

The soils of the Piedmont Plateau region are derived, through the processes of weathering, from crystalline rocks, mainly granites, gneisses, and schists, and locally from diorite. Generally the weathering of these rocks has extended to a depth of several feet and usually all traces of the parent rock within the 3-foot section have been obliterated. In the southwestern part, and also in local places in other parts of the county, the disintegrated rocks come near the surface and even outcrop.

Quartz veins are a characteristic of these rocks and may be seen in the heavy subsoil material or as loose fragments upon the surface. Fragments of the more siliceous parent rocks are also abundant locally upon the surface. The more typically developed and important soil areas are, however, practically free from stones. The character of the rocks has to a certain extent left its influence upon the surface material, resulting in fine, medium, or coarse-textured soils, as the rocks themselves were fine, medium, or coarse in texture.

[1] Each tenancy is tabulated as a "farm." The individual holding is larger than this figure.

Nevertheless, erosion, especially superficial erosion, has played an important part in type differentiation by washing out the finer particles from the surface material, thus in many instances completely changing the texture of the surface soil. The weathering of the various rocks of the county has given rise to three soil series, the Cecil, Appling, and Iredell. The Cecil series predominates, being represented by the gravelly loam, stony sandy loam, sandy loam, fine sandy loam, clay loam, and clay types. The Appling series is second in importance, but only one type, the coarse sandy loam, is found. The Iredell series is also represented by a single type, the clay loam. This soil is developed only in small bodies.

The soils of the Coastal Plain section of the county have been formed from the weathering of the unconsolidated beds of sand and clay, and locally heavy clay, which were brought down from the Piedmont Plateau and Appalachian Mountains by the streams and deposited on the sea floor when all of southern Georgia was submerged. These materials have given rise to several well-recognized soil series—the Norfolk, Orangeburg, Ruston, Greenville, and Susquehanna—which series form the greater part of the soil of southern Georgia. In the Norfolk series the coarse sand, sand, and sandy loam types are mapped. The Orangeburg soils are slightly stronger than the Norfolk. Only two types of this series, the coarse sandy loam and sandy loam, occur in the county.

The Ruston series represents an intermediate stage of oxidation in the subsoil material between the yellow of the Norfolk and the red of the Orangeburg. This series is represented in Jones County by three types—the coarse sand, coarse sandy loam, and sandy loam.

The sandy loam type is the only local representative of the Greenville series. It is, as developed here, the most productive soil of the Coastal Plain group. The sandy loam is the only member of the Susquehanna encountered in the county.

Along the border line of the Piedmont and Coastal Plain regions there is a narrow belt of soil constituting a mixture of the material of the two provinces. The surface soil is mainly Norfolk material, and the subsoil is residual material similar to the subsoil of the Cecil types. This transitional type is called the Bradley sandy loam.

Besides the upland soils of the two regions mentioned, there is a third group—the alluvial soils. The recent alluvial or first-bottom soils, occurring along the river and streams as flat, frequently overflowed lands, are the youngest soils in the county and are constantly being added to by each successive overflow. This alluvium gives the Congaree fine sandy loam and Meadow, the latter including material which is so variable in character that it can not be mapped satisfactorily on a textural basis.

The second-bottom or terrace soils, which have only a faint development in Jones County, are represented by one type, the Kalmia coarse sandy loam. This soil is confined to a few small bodies.

The local topographic conditions have necessitated the establishment of phases in two of the Cecil soils and the classification Rough gullied land. Twenty-three types, including Meadow and Rough gullied land, are mapped in the county. Of these types, those in the Piedmont section represent the strongest and most suitable lands for general farm crops. Most of these soils are susceptible of marked and permanent improvement. The soils encountered in the Coastal Plain part of the county are naturally lower in agricultural value, but are especially suited to truck crops and special farm crops, and the sandy loams, where supplied with organic matter and liberally fertilized, produce paying crops of cotton, peanuts, corn, and cowpeas.

A detailed description of each soil and its use is given in the subsequent pages of this report.

The following table gives the actual and relative extent of the various soil types mapped in Jones County:

Areas of different soils.

Soil.	Acres.	Per cent.	Soil.	Acres.	Per cent.
Cecil clay loam	102,016	42.7	Iredell clay loam	3,392	1.3
Chocolate-colored phase	384		Susquehanna sandy loam	3,136	1.2
Hilly phase	7,040		Ruston coarse sand	2,688	1.1
Cecil clay	33,728	13.1	Cecil fine sandy loam	2,624	1.0
Cecil sandy loam	17,664	7.5	Cecil gravelly loam	2,560	1.0
Hilly phase	1,472		Ruston coarse sandy loam	1,472	.6
Rough gullied land	17,536	6.8	Norfolk coarse sand	1,344	.5
Orangeburg sandy loam	10,752	4.2	Greenville sandy loam	1,152	.4
Norfolk sand	12,096	4.7	Norfolk sandy loam	1,024	.4
Ruston sandy loam	9,280	3.6	Orangeburg coarse sandy loam	768	.3
Appling coarse sandy loam	7,872	3.1	Cecil stony sandy loam	576	.2
Meadow	6,912	2.7	Kalmia coarse sandy loam	448	2
Congaree fine sandy loam	4,736	1.9			
Bradley sandy loam	3,968	1.5	Total	256,640	

GRAY SOILS.

RESIDUAL MATERIAL-CRYSTALLINE ROCKS.

Cecil Series.

The Cecil series includes the most important and widely distributed soils of the Piedmont Plateau. The surface soils are gray, brown, or red. The subsoils consist of red clay. Quartz sand and mica flakes are usually present in the subsoil. Rock outcrops are

rare, but fragments and bowlders of the parent rock are found in places on the surface. The topography is rolling to hilly, with level to undulating areas in situations where stream erosion has not been particularly active. The Cecil soils are of residual origin and are derived principally from granite and gneiss, which have weathered to great depths. The drainage as a rule is excellent.

CECIL GRAVELLY LOAM.

The fine material of the Cecil gravelly loam is variable in texture and color, as the type was differentiated on the basis of a large quantity of angular quartz fragments, which literally cover the surface and extend throughout the soil mass. The finer surface material ranges in texture from coarse sand or sandy loam to clay loam and in color from gray to reddish brown. The predominating texture to a depth of 3 to 6 inches is that of a sandy loam. The subsoil is a stiff, tenacious red clay. The gravel consists of quartz and quartzite, with a very small percentage of the parent rock material, and ranges in size from one-eighth inch to 1 inch or more in diameter.

The Cecil gravelly loam is most extensively developed about 2 miles southeast of Gray. It also occurs in small areas in the eastern part of the county, between Gray and Haddock, and south of Gray. Southwest of Clinton there are numerous small areas which represent in many cases a close approach to the Appling coarse sandy loam. Areas of this type too small to map have been encountered within the confines of the Appling coarse sandy loam.

The topography varies from gently undulating to sloping in the small areas to gently rolling in the larger areas. The surface configuration affords ample surface drainage. In this county schists as well as granite and gneiss enter into the formation of this soil, the first named in the southwestern part of the county.

The native forest consists of blackjack, black, and Spanish oaks, and yellow pine. Some persimmon and sassafras are also found.

The greater part of the type is under cultivation to the staple crops of the county, the yields being similar to those of the Cecil clay and sandy loam types. On account of the gravel it is somewhat more difficult to work than the latter types.

CECIL STONY SANDY LOAM.

The surface soil of the Cecil stony sandy loam is a gray to brownish-gray sand to light sandy loam ranging in depth from 5 to 12 inches. A few instances occur in which the soil is a sandy clay loam. The surface is literally covered with large quantities of rock fragments, mainly quartz, though fragments of the parent rock material are also found. The quantity of stones is sufficient seriously

to interfere with tillage. Other areas are mapped in which the granite outcrops as bowlders. In such areas the soil is cultivated without the serious difficulties usually met where a large quantity of loose rock lies on the surface. In general, with removal of the stones the type would become similar to the Cecil sandy loam. The subsoil is a stiff, tenacious red clay, extending to a depth of more than 3 feet.

This type is small in extent and confined to a few small areas scattered over the county. One of the largest occurs in the northwestern part just west of Fippin. This area has a more broken topography than the Cecil sandy loam, consisting of steep slopes and narrow ridges. Other small areas are found west of Wayside, southwest and northeast of Blountsville, and in the vicinity of Bradley. These areas occur as slight knolls. Where cultivation is possible the yields are about the same as those of the sandy loam type. The areas cultivated are generally included in fields mainly of better soils.

CECIL SANDY LOAM.

The soil of the Cecil sandy loam varies considerably in color and texture. In its typical development it consists of a gray to brownish-gray, medium loamy sand to light sandy loam. In some places the color is a reddish brown to red. Associated with the darker color there is usually a heavier texture, which has resulted from a part of the subsoil being incorporated with the surface material through plowing. The surface soil usually carries a quantity of coarse sand, which gives it a coarse, gritty nature. Small areas occur in which the proportion of the finer sands is relatively high, the texture tending toward a fine sandy loam. The depth of the soil varies from 5 to 12 inches, the average being approximately 8 inches. The deeper soil is lighter in texture and color and looser and more incoherent in structure. Below the surface there is sometimes a stratum of a yellowish-red or red, friable sandy loam, gradually becoming heavier with depth until it passes into the subsoil. When this stratum is absent the surface soil rests immediately on the subsoil, with little gradation between the two.

Throughout the subsoil and scattered over the surface locally are small, angular quartz gravel and quartz fragments, but these never occur in sufficient quantities to interfere with cultivation or the use of improved farm implements. Very few granite and gneiss fragments are found in the surface soil. The line of demarcation between the soil and subsoil is rather distinct. The subsoil, a stiff, tenacious, brick-red clay, occurs at a depth of from 6 to 18 inches and extends to an indeterminate depth. On some of the slopes the color is reddish yellow instead of bright red in the lower part. Bedrock is sometimes encountered within the 3-foot section, and veins

of quartz occur throughout. The subsoil contains coarse, angular sand particles, and in some cases a large quantity of mica particles.

Included with this type are small eroded areas of the Cecil clay or clay loam and a few knolls of coarse sandy loam or gravelly sandy loam. Such minor variations are likely to occur as the result of the irregularities of the surface. The extreme sandy phase of the clay loam and the shallowest phase of this type approach each other and may have been included with either one type or the other.

The Cecil sandy loam occurs throughout the greater part of the county. One of the largest single areas begins about 1 mile west of Haddock and extends for a distance of several miles north and northwest. Other important areas are found about 1½ miles northeast of Gray, 4 miles west of Clinton, at Blountsville, and in the western part of the county at Caney Creek Church and Liberty School. Small areas are scattered throughout the county. The type occupies high stream divides, knolls, and slopes either where the sandy material has not been removed or where the sand has been washed down from higher elevations and deposited over the surface. Besides the usual rocks some schist has given rise to this type, especially in the western part of the county.

The topography as a whole is gently undulating to rolling. In the western part of the county the type occupies the crests of narrow ridges lying between rough broken areas. Areas where the topography is very rolling or hilly were separated and shown on the map as a hilly phase of the type. The topographic features insure rapid and ample drainage. Terracing is a common practice on areas where the rapid run-off of the surface waters causes gullies and washes.

A forest growth consisting of several varieties of oaks originally covered much of the area of this soil. Some bodies of yellow pine also existed. The land is locally known as post-oak land, from the abundance of this species of tree.

The Cecil sandy loam is a productive soil and is easily worked, requiring only light implements. Its moisture-holding capacity is good, and crops suffer from lack of moisture only after unusually protracted droughts. With frequent shallow cultivations the surface soil acts as a good mulch for the conservation of moisture. The average yield of cotton is about one-third bale per acre, although the soil is capable of producing a bale or more per acre when properly handled. Corn produces from 10 to 40 bushels, with the low average of about 12 bushels per acre. Sweet potatoes give large yields. The soil is also well suited to the production of Irish potatoes. Oats and cowpeas do well on properly managed areas, although the average yields at present are very low. Fertilizers of various compositions are used in varying quantities.

Land values range from $20 to $70 an acre, depending upon location and improvements.

Cecil sandy loam, hilly phase.—The hilly phase of the Cecil sandy loam has been separated from the main type on account of differences in surface configuration and consequent lower agricultural value. It possesses similar physical features, except that there are more spots where the sandy material has been removed by erosion, leaving the raw clay exposed. There are a good many stones scattered over the surface. The phase occupies slopes and hilly areas, most of which are too steep to cultivate. It is best suited to pasture and forest. Practically the only areas cultivated are smooth fields, usually very small, which are planted to cotton or corn. Most of this phase is covered with second-growth shortleaf yellow pine. Only a few small areas have been mapped, and these occur in the rough section of the county along the Ocmulgee River. The largest area is at Liberty School. The value of the land ranges from $2 to $5 an acre.

CECIL FINE SANDY LOAM.

The Cecil fine sandy loam consists of a fine sand, fine loamy sand, or fine sandy loam of a gray to brownish-gray color and from 4 to 15 inches in depth, below which it grades into a yellowish-red fine sandy loam. In some cases this stratum is lacking and the surface soil rests immediately on the heavy subsoil, with a sharp line of demarcation between. Irregularities in the texture of the surface material are common, a medium texture occurring in local areas. As with the other types of the series, angular quartz fragments of various sizes are found over the surface in combination with fragments of the parent rock. The surface soil is fine and mellow, permitting easy cultivation and forming a desirable seed bed. Where the soil is shallow and plowing has incorporated considerable clay from the subsoil the darker color is usually found. Under these conditions the soil clods when plowed too wet, but is easily broken up by subsequent harrowing. The subsoil is a brick-red, stiff clay, which extends to a depth of several feet. In the lower portions it is commonly yellowish red and has a greasy feel. Mottlings of red and yellow are also quite common. Throughout the subsoil there are large quantities of minute flakes of mica, as well as quartz veins, the former being especially abundant where the parent rock is a schist. Spots having a yellowish-red subsoil are not uncommon. In the areas of this type there are frequent knolls of clay exposed by the removal of the superficial sandy covering. Gullies are sometimes found along the sides of hills.

The Cecil fine sandy loam is not extensively developed in this county, the largest areas being found in the northwestern part

along a line extending from Round Oak to Dames Ferry. A large area is located about 2 miles southeast of Glovers and another about 2½ miles southwest of Union Hill Church, in the northeastern part of the county. In the development just west of Round Oak the extreme depth of the sandy surface covering occurs. It is found here on the crest of the narrow ridge which breaks abruptly toward the stream courses on either side. The occurrence of this deep sandy mantle is not common on this type.

Topographically the Cecil fine sandy loam varies from undulating to hilly. Usually it is rolling. The type in most cases occupies narrow interstream areas which are surrounded by Rough gullied land. These ridges are found at considerable elevations above the stream channels. Ample drainage is afforded by the surface relief.

In addition to the typical crystalline rocks, schists locally enter into the composition of this type to a large extent, especially in the areas between Round Oak and the Ocmulgee River. Land of this type originally supports mainly a growth of oak, with some yellow pine, differing little, if at all, from the sandy loam in this respect.

The Cecil fine sandy loam is a productive soil, with a good moisture-holding capacity. It is best adapted to the production of general farm crops. The yields are about the same as those of the Cecil clay loam and sandy loan

The greater part of this type has been cleared and utilized for farming, but some areas are now covered with second-growth shortleaf yellow pine and oaks. The value of the land ranges from $10 to $50 an acre, depending upon improvements and location.

Appling Series.

The Appling soils are prevailingly grayish, ranging to pale yellow. The subsoils are mottled or streaked red and yellow, and occasionally grayish or drab. This series is developed in the Piedmont Plateau. The soils are residual, mainly from schist, hornblende schist, and from gneiss. These soils are not well drained.

Appling coarse sandy loam.

The surface soil of the Appling coarse sandy loam consists of a medium to coarse loamy sand of a gray or yellowish-gray color, which passes into a yellow coarse sandy loam at a depth of 6 to 8 inches. The surface soil is quite variable in respect to the color and texture of the material. In many places it contains sufficient fine particles to cause it to become rather heavy. The generally loose and incoherent nature of the other coarse sands is lacking in this type. Areas of fine to very fine sandy loam occur. The color of the soil is more of an ashy gray than that of the common gray soils of other sections

of the county. The heavy portion of the subsoil is reached anywhere between 8 and 20 inches below the surface, the type being very irregular in this respect on account of the many irregularities of the surface. The subsoil material is a mottled yellow and red, stiff, heavy clay. In local spots the color may be either red or reddish yellow. Small areas are found in which the subsoil is that of the Iredell series, but these could not be separated on account of their irregular occurrence. Small, angular quartz gravel are abundantly strewn over the surface, as well as in the soil and subsoil. These vary in size from 2 inches in diameter down, the greater number being very small. Fragments of quartz and of the parent rock are found in varying quantities over the surface, in some places being sufficient seriously to interfere with cultivation.

The Appling coarse sandy loam is developed in the southwestern part of the county. It extends from the Bibb County line northward along Walnut Creek on either side.

The type is derived mainly from the weathering of schistose rocks. Intrusions of diorites are very common locally in all these rocks. Where the diorites occur the subsoil material is somewhat heavier and tends to be more sticky. In many cases the parent rocks come within a short distance of the surface.

The surface of the type is rolling and sloping; very little of it is level or gently undulating. Surface drainage is well established. The gravel in the subsoil also tends to permit the rapid internal movement of water. The proximity of the bedrock to the surface in some places causes crops to suffer from drought.

The Appling coarse sandy loam is capable of producing good yields of the general farm crops when handled properly. It is also well adapted to peaches, strawberries, cantaloupes, and some of the early truck crops. Under the present conditions cotton yields from one-fifth to one-third of a bale, and corn from 10 to 15 bushels per acre. Much larger yields can be secured if the soil is properly prepared and organic matter, in which it is now decidedly deficient, applied.

SEDIMENTARY MATERIAL—SANDS AND CLAYS.

Bradley Series.

The surface soils of the Bradley series are gray and sandy. The subsoils are predominantly red, slightly mottled with yellow or gray, and are composed of clay. The Bradley soils consist of a thin layer of sedimentary Coastal Plain material (Norfolk), over residual Piedmont material (mainly Cecil). They are developed near the junction of the Coastal Plain and the Piedmont, or in that region where there is an overlapping of sedimentary material, upon residual Piedmont material.

BRADLEY SANDY LOAM.

The soil of the Bradley sandy loam is a gray to grayish-brown loamy sand or light sandy loam which extends to a depth of 6 or 8 inches. This material grades downward through a reddish-yellow sandy loam into the subsoil proper, which begins at a depth of 10 to 24 inches, and consists of a red, stiff, brittle clay, similar to that of the Cecil series. The bedrock from which this clay is residual is frequently encountered. Some rounded and angular quartz fragments are present in places throughout the soil section. The angular material is more plentiful at lower depths. The type includes areas in which the surface soil consists of coarse sand, but these were not separated on account of their irregular occurrence and small extent. Along Commissioner Creek occur spots too small to map which have a yellow, stiff clay subsoil, and belong to the Chesterfield series.

The Bradley sandy loam is not extensively developed in Jones County. It occurs in narrow strips across the southern part, along the line of contact between the Piedmont Plateau and the Coastal Plain provinces. The main development of the type begins a few miles south of Haddock and extends southward to Commissioner Creek, thence westward to Cumslo, and thence southward to Roberts, from which point it runs southwestward and passes out of the county along Dry Bone Creek. Two isolated areas are found about 3½ miles west of Haddock.

The type generally occupies slopes. Its topographic position is somewhat lower than that of the surrounding Coastal Plain soils. Drainage is ample.

The Bradley sandy loam is a soil of medium productiveness. The yields at present are low on account of the cultural methods in vogue. Cotton produces from one-fourth to three-fourths bale per acre and corn averages about 15 bushels.

NORFOLK SERIES.

The surface soils of the Norfolk series are prevailingly gray, ranging from light gray to grayish yellow. The subsoils are yellow and have a friable structure. These soils occupy nearly level to rolling uplands through the Atlantic and Gulf Coastal Plain. They are sedimentary in origin, being derived from unconsolidated beds of sand and clay.

NORFOLK COARSE SAND.

The Norfolk coarse sand has a depth of 36 inches or more. The surface 2 to 6 inches consists of a gray to very light gray coarse sand. There are a few small areas in depressions or along stream courses

where the organic-matter content is higher than usual and in which the color is a darker gray. The subsoil is a pale-yellow coarse sand. Throughout the soil and subsoil small subangular quartz gravel are found in varying quantities. Both the soil and subsoil are loose and incoherent.

The Norfolk coarse sand is developed in several areas in the Coastal Plain section of the county. The largest bodies occur between Commissioner and Crooked Creeks, about 3 miles northwest of Bethlehem Church. Several other important but small bodies are found in the south-central part of the county.

The topography of the type varies from level to gently undulating, with a small extent which may be said to be gently rolling. It occupies slopes and generally broad interstream areas. In only a few small areas is the surface so rough as to prevent cultivation. Owing to the excessive drainage afforded by the surface relief and by the open subsoil, the type is droughty. Along the stream courses, where the water table does not lie at so great a distance below the surface, crops do not suffer so readily through lack of moisture as in other places.

Owing to its coarse texture and loose structure, the Norfolk coarse sand is droughty and leachy and, therefore, hard to improve. The soil warms early in the spring and supports a growing crop at an earlier date than any of the other types of the county, for which reason it is best adapted to early truck crops. General farm crops suffer from drought and even in favorable seasons produce low yields unless fertilized highly. Corn averages from 8 to 15 bushels and cotton from one-fourth to one-third of a bale per acre. As high as one-half bale is produced under favorable conditions.

The greater part of the type has been cleared and devoted to agriculture. The native vegetation consisted of stunted longleaf and shortleaf pine and oaks. Blackjack, post, Spanish, red, and turtle oaks are the chief varieties found on the uncleared areas to-day. The type has never supported a heavy growth of any valuable timber.

NORFOLK SAND.

The Norfolk sand consists of a medium to coarse sand to a depth of 36 inches or more. It grades from gray or dark gray in the surface 4 to 8 inches to pale yellow in the lower part of the section. The color of the soil is usually dependent upon local conditions of topography. On the higher areas, where the drainage is excessive, the color is very light gray, while along the stream courses and in depressed areas which favor the accumulation of organic matter it is a darker gray. Included with this type are areas too small to separate, in which the surface material is of a fine or coarse texture. The soil is of a loose and incoherent nature and is usually

underlain by a substratum consisting of a compact sandy clay of a mottled color. In a few local spots this underlying material comes within the limits of the soil section and gives rise to a sandy clay subsoil, such as is found in the Norfolk sandy loam.

The Norfolk sand is the most extensively developed type in the southern or Coastal Plain section of the county. The largest areas occur in the southeastern corner of the county, between Commissioner and Slash Creeks, occupying about 50 per cent of this region. Several large areas occur farther west, in the vicinity of Griswoldville and south of Roberts. An isolated area, surrounded by Piedmont soils, is found midway between Gray and Haddock. This area occupies a narrow ridge, which lies at a considerable elevation above the surrounding soils.

The topographic relief of the Norfolk sand is generally quite pronounced. The drainage ways and streams have cut deeply into the surface, producing gently rounded to steep slopes. The type as found on the divides and ridges occupies level to gently undulating topography. A very small proportion of the type is suitable for cultivation. The soil is generally too thoroughly drained and crops suffer from lack of moisture during short dry spells. The leaching out of the organic matter of the surface greatly increases this tendency.

The Norfolk sand is not considered a good soil for general farming, on account of its loose and incoherent nature and low moisture-holding capacity. As the soil warms early in the spring and can be prepared for cultivation during the early winter and cultivated at any time of the year it is best adapted to the early truck crops. It is noted throughout the State for the production of watermelons and sweet potatoes. At the present time the type is utilized locally mainly for the production of corn and cotton, the yields of each being very low. Commercial fertilizers are depended upon to make the production profitable. It is a very difficult soil to improve.

NORFOLK SANDY LOAM.

The surface soil of the Norfolk sandy loam consists of a medium sand to loamy sand, from 4 to 10 inches deep, the average depth being 8 inches. The color is gray to dark gray in the first few inches and yellowish gray in the lower part. The subsurface stratum consists of a pale-yellow, medium to coarse loamy sand, gradually becoming heavier with depth, grading through a light sandy loam. The subsoil proper is a pale-yellow, friable, sandy clay beginning anywhere between 12 and 24 inches. This sandy clay material extends to a depth of several feet and frequently passes into a substratum of indurated sandy clay material mottled with yellow, red,

and gray colors. In local areas the heavier part of the subsoil contains faint mottlings of gray and yellow.

The Norfolk sandy loam is of small extent, being confined to the Coastal Plain region in the southern part of the county. It occurs near areas of the Norfolk sand in small, locally developed bodies where the superficial sands have been sufficiently removed to bring the underlying sandy clay within 3 feet of the surface.

The topography is undulating to rolling. Individual areas occupy knolls, gentle slopes, and stream divides. Ample surface drainage exists. In a few instances small gullies are formed along the steeper slopes. The subsoil holds considerable moisture and crops are subject to injury from drought only after extended dry periods.

The Norfolk sandy loam is a productive type of soil. Corn yields from 15 to 30 bushels and cotton from one-third to three-fourths bale per acre.

The original timber growth consisted of longleaf and shortleaf pine, with a few hardwoods, including oak and hickory. At present all of the type is cleared.

Orangeburg Series.

The Orangeburg soils are predominantly gray, ranging to reddish brown. The soils are open structured. The subsoils consist of friable red sandy clay. 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 are, like the Norfolk soils, derived from unconsolidated sands and clays.

Orangeburg coarse sandy loam.

The Orangeburg coarse sandy loam in its typical development consists of a gray coarse sand to loamy coarse sand, passing into a reddish-yellow coarse sandy loam at 6 to 12 inches. This material grades into a bright-red coarse sandy clay, which continues to a depth of 36 inches or more, where in some localities it passes into a mottled red, yellow, and gray indurated sandy clay or plastic clay. Small rounded quartz gravel are found on the surface, as well as iron pebbles, which are locally spoken of as red gravel or pimples. Ferruginous sandstone blocks or crusts are scattered over the surface, being more conspicuous, however, on the slopes surrounding the heads of small streams. Considerable variation exists in the color and texture of the soil and the depth of the subsoil. On the crests of well-defined ridges and on some of the slopes the red clay subsoil is not encountered until a depth of 24 to 30 inches is reached, while the average depth is about 18 inches. Where the subsoil comes nearer the surface it generally imparts a brown to reddish-brown

color to the soil. The type includes areas of the Orangeburg coarse sand which are too small to show on the map.

The Orangeburg coarse sandy loam is found only in the southeastern part of the county in what is locally called the sandy section. It occurs in a large area about 2 miles south of Haddock and also along the Baldwin County line in the southeastern corner of the county. The type occupies high ridges and divides. Areas of this type along stream courses and around the heads of streams are too sloping for the successful production of intertilled crops. Precautions must be used on the slopes to prevent erosion. The type is well drained, having sufficient elevation to afford surface run-off and a subsoil which is porous enough to permit the free internal movement of water. Crops are not liable to be injured seriously by drought.

The greater part of the Orangeburg coarse sandy loam has been cleared and is under cultivation. The original forest growth consisted mainly of longleaf pine.

ORANGEBURG SANDY LOAM.

The Orangeburg sandy loam consists of a gray to dark-gray or reddish-gray loamy sand to light sandy loam, which grades into a stratum of reddish-yellow, friable, light sandy loam at a depth of 6 to 10 inches. This lower material gradually becomes heavier and redder in color until the subsoil is reached. The typical subsoil consists of a bright-red, friable sandy clay and is found at depths varying from 10 to 30 inches, depending upon the topography and the resulting effect of erosion. Over many of the areas small waterworn gravel and iron accretions are present. Crusts of ferruginous sandstone are scattered over the surface in many places and may be encountered throughout the soil profile. Especially do those areas on the steeper slopes surrounding the heads of small streams show this characteristic. There are small areas in which the subsoil occurs sufficiently near the surface to impart a red color to the soil. These areas, had they been of sufficient size, would have been mapped as the Greenville sandy loam. Small areas where the red sandy clay subsoil is not found within the 3-foot section also occur, as well as areas of Orangeburg fine sandy loam and coarse sandy loam which are too small to show on a map of the scale used.

The Orangeburg sandy loam is confined to what is locally known as the sandy section of the county or the Coastal Plain in the southeastern and southern parts. One of the largest and most typically developed areas occurs in the vicinity of Cumslo and Roberts, on the Athens branch of the Central of Georgia Railway. Several other large areas occur along Sandy Creek and in the eastern part

of the county, as well as northwest and west of Haddock. Smaller but important areas are found interspersed among other soil types in the southern part of the county.

The material which gives rise to the Orangeburg sandy loam is of marine origin, having been derived from the Piedmont and Appalachian regions and deposited in the ocean. It differs from the other soils of this series in the texture of the surface soil and the depth of the subsoil.

The surface configuration of the type includes broad, level interstream areas, gentle slopes, and, along the stream courses, many steep slopes. As a whole, the topography is gently sloping to rolling. Only a small percentage of the type is too steep to be cultivated. In all the areas ample drainage is afforded by the surface relief and by the loose structure of the subsoil. On some of the slopes where the subsoil lies at a considerable depth the drainage is excessive.

The Orangeburg sandy loam is a fairly productive soil, being well suited to the production of the staple crops of the region, as well as early truck crops. It is easily cultivated and holds moisture well. Corn, cotton, and oats are the chief crops grown. Corn produces from 10 to 35 bushels per acre and oats from 15 to 25 bushels. Cotton produces from one-third to 1 bale per acre, depending upon the cultural methods employed. The soil is also well adapted to the production of cowpeas, velvet beans, rye, and vetch. Various truck crops may be grown upon it. This soil is noted in the South Atlantic Coast States for the production of peaches. Much of the type in this county is set out in peach orchards, which are yielding profitable returns. The yields of field crops are low, continued cultivation of the soil having resulted in the depletion of its organic-matter content.

The greater part of the type has been cleared of the original timber growth of longleaf and shortleaf pine. Many large farms, however, are lying idle.

Ruston Series.

The Ruston soils are gray, ranging to grayish brown. The subsoils are reddish yellow to yellowish red or dull red and are moderately friable, consisting generally of sandy clay. Occasionally the lower subsoils are mottled with gray and shades of yellow. This series is intermediate between the Orangeburg and Norfolk on the one hand and the Susquehanna on the other in point of subsoil structure. The Ruston soils are closely associated with the Orangeburg and Susquehanna. They are sedimentary in origin.

RUSTON COARSE SAND.

The Ruston coarse sand consists of a gray or brownish-gray coarse sand or coarse loamy sand, underlain at a depth of 6 to 8 inches by

a reddish-yellow or yellowish-red, loose, and incoherent coarse sand. In low spots the surface soil is of a brown or dark-brown color, owing to the accumulation of organic matter through seepage. In a few places the subsoil has also been found to be of a slightly reddish-brown color. The type is underlain by a coarse, compact sandy clay, usually at a depth of more than 3 feet, which in local areas comes sufficiently near the surface to produce a coarse sandy clay throughout the soil profile. Such areas have been included in this type, on account of their small extent. Small rounded quartz gravel are found scattered over the surface and throughout the soil mass in varying quantities.

The Ruston coarse sand is found in several large bodies in the Coastal Plain section in the southeastern part of the county. One of the most typical areas is located about 1½ miles northwest of Bethlehem Church. Another area occurs along the Baldwin County line about 6 miles south of Haddock. In this area there are local spots of the Norfolk coarse sand which are too small to be shown on the map. A branch of Crooked Creek flows through a third large area about 3½ miles southeast of James. Other small areas are found along Slash Creek and south of Roberts.

The type occupies knolls, slopes, and ridges and has a generally undulating to gently rolling topography, which, together with the porous subsoil, affords ample drainage. In a few instances, as on slopes, gullies are formed by erosion. Stream courses cut deep channels, which prevent the occurrence of swampy areas within the confines of the type.

The Ruston coarse sand represents a gradation between the Orangeburg and Norfolk soils caused by differences in oxidation and leaching.

Although the Ruston coarse sand is of low fertility, it is somewhat higher in agricultural value than either the Norfolk sand or coarse sand. This is principally owing to the higher percentage of fine material contained in the subsoil, which makes the type more retentive of moisture. The soil is better adapted to early truck crops than to general farm crops, the latter being subject to injury by drought. Corn produces only small yields, ranging from 5 to 15 bushels per acre. Cotton averages from one-fifth to one-half bale and under exceptionally good cultural methods it may be made to yield three-fourths bale per acre. Oats make a short growth of straw and the yield of grain is small.

The type was originally covered with longleaf and shortleaf pine and various species of oaks. Nearly all the timber has been removed and the land utilized for farming. Much of the land has been abandoned in the last few years.

RUSTON COARSE SANDY LOAM.

The Ruston coarse sandy loam consists of a gray to dark-gray and in some local areas of a brownish-gray coarse sand to loamy coarse sand, grading into a reddish-yellow loamy sand at a depth of 6 to 8 inches. This material becomes redder and heavier in texture with depth until it passes into a yellowish-red or reddish-yellow, friable coarse sandy clay at a depth ranging from 18 to 28 inches. The surface soil is generally loose and incoherent, on account of the lack of organic matter. It is easily worked into a good tilth, and cultivation can be performed at any time during the growing season. There are areas included under this type in which the sandy clay material does not come within the 3-foot section, and which are generally too small to include with the Ruston coarse sand. Iron accretions are found in local spots to a small extent.

The Ruston coarse sandy loam is not extensively developed in the county, being confined to the Coastal Plain section. The main areas are located between Commissioner Creek and the Baldwin County line, in the southeastern part of the county. Several other small areas may be found in the section between Commissioner and Slash Creeks.

The type occupies ridges, knolls, and slopes, the topography in general being somewhat undulating to gently rolling. The greater acreage is found along slopes where the sandy covering has been removed by erosion. The drainage is well established.

The Ruston coarse sandy loam from an agricultural standpoint is intermediate between the Ruston coarse sand and sandy loam, being somewhat better than the former. The loose, porous nature of the surface soil and the upper part of the subsoil allows the moisture to pass rapidly through, and the sandy clay material below arrests and holds it. Owing to the cultural methods employed and the low content of organic matter in this soil, yields of the staple crops are low. The soil is adapted to truck crops, light farming, berries, melons, and, when supplied with organic matter, to cotton, cowpeas, rye, and corn.

RUSTON SANDY LOAM.

The soil of the Ruston sandy loam varies from a gray to brownish-gray and in some places brown, loose, medium or coarse sand to medium to coarse loamy sand. The depth varies from 4 to 12 inches, the average being about 7 inches. The heavier texture and more coherent structure are generally associated with the darker colors. Fine waterworn or rounded quartz gravel is scattered throughout

the surface soil. The subsurface stratum consists of a reddish-yellow to yellowish-red, friable, medium to coarse sandy loam, becoming heavier with increased depth. The subsoil, beginning at a depth of 12 to 20 inches, is a friable sandy clay of reddish-yellow to reddish-brown color. The lower part of the subsoil is quite variable, the material frequently being very heavy, tough, and sticky, while the color may also contain mottlings of various shades of yellow, brown, red, and gray. Fine, rounded quartz gravel is always found in the subsoil, as well as occasional blocks of ferruginous sandstone. The substratum material, consisting of an indurated sandy clay, with pockets of kaolin, may approach the surface sufficiently to exert a modifying influence and to cause irregularity in the subsoil material. In general the type would be considered variable. It includes areas of Ruston sand, coarse sand, and coarse sandy loam and of Susquehanna, Orangeburg, and Norfolk soils which are too small to show on a map of the scale used.

The Ruston sandy loam is derived from material originally similar to that giving the Susquehanna, Orangeburg, and Norfolk soils. The differentiation depends on the stage of oxidation which the soil material has reached, the Ruston being intermediate in point of color, which is taken as the indication of degree of oxidation, between the Norfolk and Orangeburg soils. The type is confined entirely to the Coastal Plain section of the county and generally follows small streams and branches reaching back toward the crests of ridges. With the exception of the Norfolk sand, it is the most extensively developed type in the Coastal Plain. It occurs in rather large areas along Sandy, Slash, and Crooked Creeks. Some of the slopes are quite steep and have been subjected to erosion to such an extent that the sandy surface material has been removed, leaving the sandy clay subsoil exposed. In such areas the surface is broken by gullies. As a whole the topography is undulating to rolling, with a few level to gently undulating areas. The position of this type is always somewhat lower than that of the surrounding types. Nevertheless drainage is well established.

The Ruston sandy loam is a fairly productive soil for the staple crops of the region. The surface soil is friable, loose, and easily cultivated. The subsoil prevents the rapid loss of moisture and fertilizers through leaching. Under proper cultural methods corn produces from 20 to 40 bushels and cotton from three-fourths bale to 1 bale per acre. Commercial fertilizers are in general use.

The original forest growth of longleaf yellow pine has been removed. Steep slopes and eroded areas are now covered by second-growth pine, with an undergrowth of broom sedge.

Susquehanna Series.

The Susquehanna soils are gray, ranging to reddish. The subsoils are mottled gray and red or gray, red, and yellow, and consist of plastic, heavy clay. The color of the subsoils 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.

SUSQUEHANNA SANDY LOAM.

The Susquehanna sandy loam in its typical development consists of a light to dark-gray medium sand or loamy sand which grades into a yellow or reddish-yellow, friable loamy sand to sandy loam at a depth of 4 to 6 inches. In some places this lower portion is lacking and the gray surface soil rests immediately upon the subsoil. A few spots occur from which nearly all the surficial covering of sand has been removed by erosion, leaving the raw subsoil material exposed. The subsoil is typically found at a depth of 10 to 15 inches and consists of a heavy, sticky, plastic, impervious clay of a bright to dull-red color, intensely mottled with gray. Local areas occur in which the subsoil seems to be more granular than usual, approaching somewhat the color of the Orangeburg and the structure of the Ruston types. Included in this type are several areas of the Susquehanna clay which were too small to map.

The Susquehanna sandy loam is developed in several irregular bodies in the southern part of the county. The chief areas extend from the vicinity of Roberts southeastward to Burden School. A large body is located about 3 miles northeast of Roberts. There is also a well-developed area extending from the most southern corner of the county northward beyond the Central of Georgia Railway.

The type occupies slopes and crests of ridges and has a topography varying from gently undulating to rolling. At the base of slopes around the heads of small streams the surface is more or less level to gently sloping and in some small areas flat. As a whole, the type is well drained, though on level areas surface water remains for a considerable length of time, owing to the impervious nature of the subsoil. Erosion has cut the steeper slopes considerably, causing them to have a very broken appearance.

The material forming the type is derived from beds of plastic clay in the Coastal Plain deposits. Lack of aeration and proper oxidation has retarded weathering of the material, a fact made plain by the mottled coloration of the subsoil. The impervious and intract-

able nature of the subsoil is the chief drawback in cultivating this soil. When the subsoil comes near the surface the type can only be handled under perfect moisture conditions. When wet it becomes too sticky and plastic to plow and when dry it becomes too hard. The most desirable areas to farm are those in which the subsoil lies at depths between 12 and 20 inches. This soil is used for the production of oats, corn, cowpeas, and cotton, of which fair yields are obtained.

WATER-LAID MATERIAL (OLD ALLUVIUM)—MIXED DERIVATION.

KALMIA SERIES.

The surface soils of the Kalmia series are gray, ranging to grayish yellow, and the subsoils are mottled gray and yellow. The series is developed along streams of the Coastal Plain region on terraces lying largely above overflow. The Kalmia soils occur most extensively in the Coastal Plain region of Mississippi and Alabama. They are derived largely from material washed from the Coastal Plain soils, although along the larger streams issuing from the Appalachian Mountains and Piedmont Plateau more or less material from these regions is present. 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 soils are closely related to the Cahaba, differing mainly in their poorer drainage and the consequent less oxidized condition of their subsoils. The surface is usually flat.

KALMIA COARSE SANDY LOAM.

The surface soil of the Kalmia coarse sandy loam consists of a light-gray coarse sand or loamy coarse sand, which grades at a depth varying from 4 to 6 inches into a pale-yellow or, in some places, a white coarse loamy sand containing a few small, subangular gravel. The typical subsoil is found at depths ranging from 12 to 20 inches and consists of a pale-yellow, friable coarse sandy clay, with frequent mottlings of gray, drab, and white. In many places the soil consists of a dark-gray sandy loam carrying a large quantity of fine material and organic matter, while the subsoil consists of a mottled drab, gray, red, pink, and cream-colored coarse sandy clay. The structure of this material is somewhat tough, compact, or slightly indurated, and yet friable, owing to the percentages of sand and coarse sand which it contains. In all of the areas of the type the occurrence of small waterworn gravel is conspicuous. Small areas of a very local nature occur in which the subsoil is either a dull-red, friable sandy clay or a mottled drab and yellow, plastic clay. These areas represent the Cahaba and Leaf coarse sandy

loams, respectively, but, on account of their small extent, they could not be shown on a map of the scale used.

The Kalmia coarse sandy loam occurs as several small well-defined terraces or second bottoms in the southeastern part of the county along Commissioner Creek, in the vicinity of Bethlehem Church. It occupies a position about 2 to 30 feet higher than the first or overflowed bottoms of the creek and distinctly lower than the upland, the line between the upland and the terraces being generally pronounced. The surface is generally flat to very gently undulating, but has sufficient fall toward the stream channels to insure fair surface drainage. During seasons of continued rains the water table rises sufficiently to cause the surface soil to become soggy and difficult to work. During periods of drought crops are not as subject to injury on this type as on the upland soils.

The Kalmia coarse sandy loam is fairly productive. From 15 to 40 bushels of corn and one-third to one-half bale of cotton per acre are the ordinary ranges in the yield of these staples, the differences depending mainly upon the cultural methods employed. The soil is generally deficient in organic matter.

RED SOILS.

RESIDUAL MATERIAL—CRYSTALLINE ROCKS.

CECIL SERIES.[1]

CECIL CLAY LOAM.

The Cecil clay loam consists of a reddish to reddish-brown, heavy sandy loam or clay loam, varying in depth from 4 to 8 inches. There are places where the soil is a sandy loam to a depth of 2 to 4 inches. The subsoil is a stiff, fairly brittle, brick-red clay, throughout which occur veins of quartz and varying quantities of mica flakes. In places the lower subsoil is reddish yellow. There are some outcroppings of granite bowlders on the surface, but not over areas large enough to justify a separation on the map. The parent rock material occasionally comes within 3 feet of the surface. Included in the type are areas of the Cecil sandy loam and clay which were too small to map. These usually occur on slopes, where there is an unequal distribution of the sandy surface material caused by erosion. Such areas present a spotted appearance.

The Cecil clay loam is the predominant soil type of the county, and the most extensively used for agriculture.

It has been derived from the weathering of granite and gneiss. Schists have played little or no part in its formation. The granitoid and gneissoid structure may be seen in certain parts of the subsoil.

[1] For series description, see p. 19.

The type occupies the level to gently undulating interstream areas over the greater part of the county. The streams which flow through it have cut somewhat deeply into the surface, giving rise to rounded and smooth slopes. On some of the slopes it is necessary to use terraces from 40 to 60 feet apart in order to control erosion. The surface drainage is excellent, sometimes excessive, and crops are subject to injury during long-continued drought.

The greater part of the native forest growth, which consisted of yellow pine, has been removed. Second-growth yellow pine, hickory, sassafras, dogwood, and gum are among the trees now found on the type.

The soil is naturally productive and durable, but a large part of it has suffered through depletion of the organic-matter supply through continuous cultivation of clean-culture crops. With the use of several hundred pounds of commercial fertilizer cotton averages about one-third bale per acre. The soil is capable of producing 1 bale or more per acre under proper management. The average yield of corn is 15 bushels per acre. Yields of 40 to 50 bushels have been secured under favorable conditions. Most of the peach orchards of the county are on this type, the orchards proving very successful. The soil is admirably suited to the production of cowpeas, vetch, soy beans, and the clovers, and excellent pastures can be maintained.

Land of the Cecil clay loam sells at $20 to $60 an acre, location in respect to towns and lines of transportation being the chief factor causing the higher figures.

Cecil clay loam, chocolate-colored phase.—The Cecil clay loam, chocolate-colored phase, consists of a dark-brown, chocolate, or snuff-colored loam, which grades into a reddish-brown loam or clay loam at a depth of about 4 to 8 inches. This stratum extends to an average depth of 12 inches, where it passes into a reddish-brown, friable clay loam or red clay. In some cases it extends as deep as 24 to 30 inches. The subsoil material, although fairly stiff and tenacious in some places, is generally more loamy and friable than that of the main type. The color characteristics of the phase have given rise to the local expressions "chocolate loam" or "snuff-colored land." The soil is somewhat difficult to work, as it does not scour on the plow, which must be cleaned continually. On this account the phase is also locally called "dead land" or "push land."

This phase is very inextensively developed in Jones County, occurring only in a few small, widely scattered areas.

The topography is nearly level or very gently rolling. Aside from the difficulty of plowing, the soil is well suited to the production of corn, cotton, oats, and peaches.

Cecil clay loam, hilly phase.—The hilly phase of the Cecil clay loam has all the physical characteristics of the main type. It has

larger areas of gall or eroded spots, where the clay is exposed at the surface, and contains considerably more rock fragments.

This phase occupies slopes and hillsides lying between the rolling areas of the Cecil clay loam and the stream courses. The principal development is in the western part of the county, along the Ocmulgee River. It extends eastward several miles to within 1 or 2 miles of Round Oak. This section is recognized as the roughest part of the county. Only the smoother portions of the phase can be farmed, and the land must be closely terraced to prevent erosion. On account of the topography, the drainage is too thoroughly established, and there is little chance for the water to soak in through the subsoil.

The original timber has been removed. Wild plum, hawthorn, smilax, and blackberry are characteristic vegetation. Only a few areas are under cultivation. The phase is best suited for use as pasture land. The average value of this land varies from $2 to $15 an acre.

CECIL CLAY.

The Cecil clay consists of a dull or brick-red, stiff, tenacious clay several feet in depth. In places the surface soil to a depth of 1 to 3 inches consists of a heavy loam or clay loam of a dull-red color. Fragments of quartz are scattered over the surface and quartz veins occur throughout the soil section, but not in sufficient quantities to affect cultivation. The type also contains varying quantities of mica flakes.

Included with the Cecil clay are areas of the Cecil sandy loam and clay loam too small to map. Many areas of the clay are spotted with these types.

The Cecil clay is the second soil in point of extent. One of the largest areas reaches north from Round Oak to the county line in a continuous body, except for included areas of Meadow and Cecil clay loam. Another extensive area begins in the northeastern corner of the county and follows Big Cedar Creek southwestward to Stewart Chapel and thence southward to within a short distance of Bradley. Between Bradley and Round Oak a large occurrence of the type follows the various branches of Shoal Creek. These areas comprise the greater part of the type. Smaller bodies lie in the vicinity of Stallings and Clinton. Other bodies of varying size are scattered throughout the entire Piedmont section.

The Cecil clay represents sandy loam areas from which the sandy material has been removed by erosion, leaving the heavy underlying clays exposed. It is the irregularity in the removal of the sandy material that has given rise to the spotted condition of the soil. Erosion is also responsible for the presence of the rock outcrops and surface bowlders.

The topography ranges from undulating to rolling. In some places, especially in the western part of the county, it is very rolling to hilly, though on the crests of the ridges or divides the surface may be gently undulating, with here and there a few level stretches. The surface configuration gives ample drainage.

Characteristic vegetation on this soil includes the yellow and scrub pines, sassafras, black gum, hawthorn, smilax, and blackberry.

The Cecil clay is one of the best soils in Jones County for general farm crops. Cotton and corn are the principal crops grown. Cotton yields as high as 1 bale per acre, although the average is one-third of a bale. Corn ordinarily yields from 10 to 20 bushels per acre, although 40 bushels are obtained in favorable seasons on some farms. The soil is well adapted to oats, wheat, rye, cowpeas, and grasses. Peach trees make a thrifty growth, and are long lived and productive. A good deal of this type is now in peach orchards.

Land values range from $10 to $70 an acre, depending upon location and improvements, the average being about $40.

SEDIMENTARY MATERIAL—SANDS AND CLAYS.

Greenville Series.

The soils of the Greenville series are prevailingly red, ranging from dark to reddish brown. These soils are closely associated with those of the Orangeburg series in distribution. The subsoils are influenced to some extent by the underlying limestone which is encountered in some places. The soils are generally more retentive of moisture than the Orangeburg soils. They occupy level to gently rolling areas in the Coastal Plain uplands. The material is sedimentary, mainly from sands and clays.

GREENVILLE SANDY LOAM.

The Greenville sandy loam consists of a dark-red to brownish-red, medium to coarse sandy loam, underlain at a depth of 6 to 8 inches by a heavy, stiff, friable sandy clay of a dark-red color. Over the surface are found small quantities of iron pebbles and in some local areas scattered blocks of ferruginous sandstone occur. The soil is generally loose and friable and easily worked.

This type is confined to small scattered areas in the southern part of the county. The largest of these are found southwest of Roberts, in the vicinity of Dry Bone Creek. An important area is located about 3 miles east of Gray, on the road between Gray and Haddock.

The Greenville sandy loam occupies knolls and the highest portions of the divides and interstream areas. In some instances it represents areas where erosion has removed the greater part of the

sandy surface of the Orangeburg soils, exposing the red subsoil material. The red color of the surface is here due chiefly to the fact that the subsoil material lying closer to the surface has become incorporated with the superficial sands by the oxidation of the iron compounds. The drainage of the several areas is well established and on a few slopes excessive.

This is one of the strongest soils of the Coastal Plain section of the county. Both surface and subsoil are very retentive of moisture and only in case of extreme drought are crops seriously affected.

Cotton is the most important crop, the yields ranging from one-third to three-fourths bale per acre. Corn and oats, with proper attention, can be made to produce good crops. The ordinary yields obtained at present are low. From 25 to 50 bushels per acre should readily be produced. Cowpeas are very productive on this soil. They are grown for hay.

BROWN SOILS.

RESIDUAL MATERIAL—CRYSTALLINE ROCKS.

Iredell Series.

The surface soils of the Iredell series are prevailingly brown, ranging from light brown to almost black. They frequently contain small iron concretions. The subsoils consist of extremely plastic, sticky, or waxy clay of yellowish-brown to greenish-yellow color, passing into disintegrated rock, often within the 3-foot section. This series is developed in the Piedmont Plateau. The soils are residual, the parent rock consisting mainly of diorite, hornblende schist, or hornblende gneiss. The topography varies from nearly flat to gently rolling. The drainage is usually good.

IREDELL CLAY LOAM.

The Iredell clay loam, as found in this county, varies considerably in the characteristics of the surface material. While in the greater part of the areas mapped it consists of a heavy sandy loam to clay loam, with a depth of 3 to 5 inches, there are many areas where it is deeper and of lighter texture. It was impracticable to plot the variations in this type on a map of the scale used in the survey.

The characteristic color of the typical soil is gray to brown. The most important characteristic is its heavy, plastic, and tough subsoil of yellowish brown, mottled with yellow, drab, and gray. A general tone of greenish or olive in the subsoil enables the differentiation of the material from other Piedmont soils of similar derivation. The subsoil usually grades into the partially decomposed rock at a depth of 2 to 3 feet. Fragments of diorite, schists, granite, and quartz are

scattered over the surface in varying quantities. The diorite fragments are rounded and range from 6 inches to 4 feet in diameter.

The Iredell clay loam is not extensively developed in this county. The largest area occurs in the northwestern corner, in the vicinity of Glovers, with smaller areas to the southwest. Small areas are scattered over the entire Piedmont section of the county, especially along the slopes adjacent to small stream courses. Many of these are too small to map. A few small areas occur in the eastern part, near Haddock.

The larger areas of the Iredell clay loam occupy rolling to hilly country and are generally unsuitable for farming. The smaller bodies usually have a gently rolling topography and are cultivated along with the adjoining types of soil. Movement of the water through the subsoil is slow and on small, level areas water stands until removed by evaporation.

This type originally supported a growth of deciduous trees, such as white oak, poplar, and hickory.

This type is rather difficult to cultivate on account of the intractable subsoil. It is a late soil, and remains wet for a considerable time after heavy rains. Cotton, corn, and oats are the principal crops grown. Rather low yields are obtained, oats doing better than the other crops.

WATER-LAID MATERIAL (RECENT ALLUVIUM)— MIXED DERIVATION.

CONGAREE SERIES.

The Congaree soils are brown to reddish brown. There is comparatively little change in color, structure, and texture from the surface downward, though occasionally grayish and yellowish mottling is encountered in the subsoil of poorly drained areas. These soils are developed in the overflowed first bottoms of the streams of the Piedmont region and those in the Coastal Plain issuing from the Piedmont. The material is derived from the soils of the Piedmont region, with some admixture of wash from Appalachian soils, and in the Coastal Plain a slight admixture of wash from Coastal Plain soils. The soils are usually poorly drained.

CONGAREE FINE SANDY LOAM.

The Congaree fine sandy loam, in its typical development, consists of a dark-brown or chocolate-brown fine sandy loam, underlain at about 8 inches by a light-brown to reddish-brown fine sandy loam. Small scales of mica occur in large quantities throughout the soil and subsoil. As the type is frequently overflowed, it includes areas of varying texture. In the northeastern part of the county, along

Big Cedar Creek, there are narrow strips in which the surface soil consists of a silty clay to clay. There are also small, irregular areas of fine sand, sandy loam, and loam. All of these areas have been included under the one general type on account of their instability. In places considerable departures from the type description occur below the surface. Fine sands, fine sandy loams, and clay of a mottled gray and brown color may be encountered in one boring. Few areas can be found that are uniform in color and texture. This is, however, usually the case with alluvial soils.

The Congaree fine sandy loam occupies the first-bottom lands of the Ocmulgee River and the other large stream courses, including Commissioner and Walnut Creeks. The surface is generally smooth and almost flat, with only a slight slope in the direction of the streams.

The usual vegetation consists of sycamore, sweet gum, alder, willow, and box elder, with an occasional yellow pine.

This type is at present utilized for pasture and for the production of hay, corn, and oats. The soil is very productive, yielding from 20 to 50 bushels of corn without the use of commercial fertilizers. Not much of this land is used for the production of staple crops, on account of the liability to injury by flood.

MISCELLANEOUS MATERIAL.

ROUGH GULLIED LAND.

Rough gullied land occupies steep slopes along the stream courses and generally occurs between the upland soil and the bottom land. In the northwestern part of the county, where it is largely developed, it lies between the hilly phase of the Cecil clay loam above and the Meadow below. The surface is badly eroded. This type is practically waste land, as the surface is too uneven for farming. It should be kept in forest or planted to some binding grass and used for pasture.

MEADOW.

Meadow includes a variety of soil materials, ranging from coarse sand to clay loam. The color is usually brown. It occurs as narrow strips of first bottom along many of the streams of the county. A large part of it is subject to overflow and some of it remains in a wet condition throughout the greater part of the year. Very little of this land is cultivated. Sorghum is grown occasionally in small areas. To reclaim the land considerable ditching and diking are necessary, as well as the clearing of obstructions from the streams. Much of it could be utilized for pasture and the production of hay. The vegetation on Meadow is similar to that typifying the Congaree.

A dense undergrowth of bamboo briers, willows, and reeds is present in local areas.

SUMMARY.

Jones County, Georgia, lies in the geographical center of the State, along the zone of contact of the Piedmont Plateau and the Coastal Plain. It contains an area of 401 square miles, or 256,640 acres. The topography varies from smooth, level to undulating stream divides to hilly and broken areas. The drainage is performed by the Ocmulgee and Oconee Rivers and their tributaries.

The first settlements were made in the northern part of the county, in the vicinity of Round Oak, and in the northeastern section about 1806. The early settlers were Scotch-Irish, coming from other sections of the State. The county at present is sparsely settled. Gray, the county seat, is located on the Athens branch of the Central of Georgia Railway.

The climate is characterized by long, hot summers and short winters. The average date of the last killing frost in the spring is March 16 and of the first in fall November 12. This gives a long growing season.

Cotton is the most important money crop of the county, more than 44 per cent of the improved farm acreage being devoted to its production. The average yield is about one-third bale per acre.

Corn is the second crop in importance in the county, although not enough is produced to supply home needs.

Oats are also grown to some extent.

The production of peaches is a special industry which has been very profitable, about 16 per cent of the State's crop being produced in this county.

Dairying and stock raising are not developed; the farm animals of the county consisting chiefly of work stock.

The soils of the county have been divided into 23 types, with 3 phases. Nine of the types and the 3 phases are found in the Piedmont section and represent the best general farm soils in the county. Eleven types occur in the Coastal Plain section of the county. These soils, as a general rule, are better suited to trucking and special crops. Two types are alluvial material, and one, the Bradley, is a transitional type formed where the Coastal Plain overlaps the Piedmont.

The soils range from incoherent coarse sands of low agricultural value to stiff, heavy clays forming the most valuable farming lands of Georgia. The Cecil soils are the most productive, the Greenville and Orangeburg soils ranking next.

The land is held in large tracts, and the chief need of the county is to encourage settlement by dividing these tracts into small farms.

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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.]

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