SOIL SURVEY OF BULLOCH COUNTY, GEORGIA.

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DESCRIPTION OF THE AREA.

Bulloch County is situated in the east-central part of Georgia, being separated from the Savannah River by Effingham and Screven Counties and from the Atlantic Ocean, which lies 40 miles southeast, by Bryan County. The county is irregular in outline, its long axis extending northwest and southeast. It lies between the Ogeechee and the Canoochee Rivers, these streams having a general southeasterly course. On the east the Ogeechee separates Bulloch from Effingham and Screven Counties, while the Canoochee separates it from Tattnall. On the south the county is bounded by Bryan County and on the northwest and north by Emanuel and Jenkins Counties, respectively. Bulloch is among the largest counties in the State, having an area of approximately 787 square miles, or 503,680 acres.

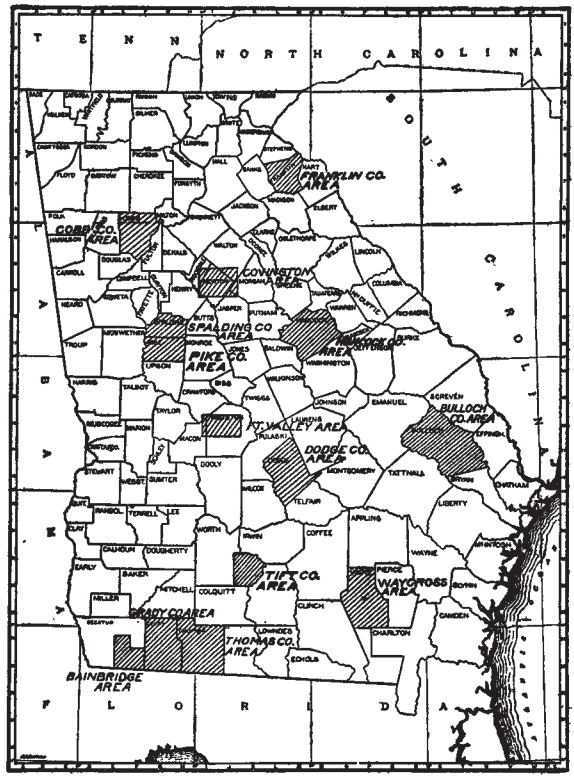

FIG. 12.—Sketch map showing location of the Bulloch County area, Georgia.

Bulloch County lies in the physiographic province known as the Atlantic Coastal Plain, a more or less eroded plain extending as a broad belt along the Atlantic Ocean from Long Island and New

Jersey southward. Topographically this plain consists of two belts. The outer one has its eastern boundary on the coast and its western running approximately parallel to the coast and from a very few to 40 miles inland. It is an almost featureless plain and is usually called the Flatwoods region. It rises gradually inland, the elevation along the inner margin reaching a maximum elevation of less than 100 feet. The inner belt lies west of the outer and extends from it to the hilly and more or less stony upland region known as the Piedmont Plateau. This belt of the Coastal Plain varies from less than 100 to about 500 feet in elevation. It is predominantly a plain, but it has been so extensively eroded that its original character is almost destroyed. It is now a rolling to low hilly region. Bulloch County lies across the boundary between the flat Coastal Plain and its rolling part. The flat Coastal Plain reaches up into the southeast part of the county, where it covers the larger parts of Bay, Brier Patch, and Brooklet Districts. A line drawn from Bulloch Bay on the southern boundary through the village of Brooklet to Mill Creek approximately separates the flat part from the higher rolling part of the county.

The forest growth is mostly longleaf and shortleaf pine. The larger stream courses starting in the higher lands have cut valleys below the upland level, but the gradient is so slight that they are generally sluggish and are bordered by swamps, their courses being defined by characteristic swampy vegetation—a mixture of cypress, gum, magnolia, bay, and pine—often with an almost impenetrable undergrowth. The smaller branches are poorly defined, their presence generally being indicated by narrow fringes of swampy vegetation widening in places to shallow basins, locally known as " bays," in which either cypress or gum predominates, with gallberry and swamp huckleberry bushes around their borders. These bays are probably partially filled-in depressions of limestone sinks, limestone occurring some hundred feet below the surface. The largest of the bays is Bulloch Bay, on the southern boundary, a mucky to peaty swamp. Other prominent bays occur in the vicinity of Brooklet.

The elevation of the flatwoods above sea level, while no absolute data are available, ranges from approximately 35 feet above mean tide in the southeast corner of the county to about 100 feet above where the flatwoods district merges into the higher rolling part of the county. The highest elevation, found at the head of Lotts Creek in the upland section, is approximately 200 feet. The remainder of the county—the larger part—is rolling to ridgy, the main stream divides being flat to undulating areas. These extend as ridges between the streams, to which, in the more inland sections, the slopes are comparatively short and steep. Toward the southeast these ridges broaden and flatten out, the crests being less prominent, until where they merge into the flatwoods they are comparatively flat and but

slightly above the streams. The intricate drainage system eroded into the higher lands has rendered the surface broken, and no very large tracts uncut by drainage courses exist. The smaller streams are seepage depressions, rendering their courses more or less swampy. The large creeks have carved out valleys, but are also bordered by low, swampy first bottoms. The Ogeechee River has in past time eroded a troughlike valley with swampy flood plains along part of its course, and has developed also two higher terraces, the remnants of old flood plains when the river was at a higher level than now, or when the land lay at a lower level.

The drainage of Bulloch County is into the Ogeechee River, both directly and indirectly. The Ogeechee flows along the eastern boundary, receiving creeks and branches draining the eastern parts. The principal tributary streams are Mill Creek in the northeast part and Black Creek in the southeast. The Canoochee River is the main affluent of the Ogeechee, emptying into it in the county below. It receives the drainage of the western and central parts of Bulloch County. Its main tributaries are Fifteen Mile and Lotts Creeks. Lotts Creek extends through the west-central part, and is the most important stream within the county. The general trend of drainage is to the south and southeast. The Ogeechee finally empties into the Atlantic Ocean below Savannah. In the southeastern part of the county, where the surface is flat and low, drainage is not well established; it is marked by indefinite stream courses and by numerous "bays." At times of excessive rainfall the water, because of the general imperviousness of the underlying materials, remains on the surface until it evaporates or seeps gradually away. In the remainder of the county the surface is rolling, and an intricate system of drainage is established, but the smaller streams even here do not have well-defined channels, often spreading out over depressions and forming swampy and semiswampy areas. In such cases the drainage is largely by seepage rather than by surface flow.

The first settlement made in Georgia was by Oglethorpe at Savannah in 1733, and from this settlement later sprung the settlements in the surrounding parts of Georgia. What is now Bulloch County was originally included in the parish with Savannah. Later it was a part of Effingham County. Shortly before the Revolutionary War settlement was made along the Ogeechee River. The earliest pioneers settled in the lower part of the county and settlement soon extended along the whole course of the river. Then followed scattered settlements along the Canoochee, and finally in the interior sections of the county. Most of these early settlers obtained their grants for land from the King of England. After the Revolutionary War colonists from the Carolinas began moving this way. All these early settlers were English or of English descent. The development of the county was very slow, and not until some time after the Civil

War was the increase in population very marked. In 1880 the population was only about 8,000; after that it increased more rapidly, and by 1900 the census gave a population of 21,377. Now it is 26,464. There are some negroes in the county, but the proportion of this race is small as compared to populations in surrounding sections in the State. The present white population is largely composed of the descendants of the early pioneers, though in recent years considerable numbers have come from north and middle Georgia, as well as numbers from North and South Carolina. The population is largely rural, probably not over one-fifth residing in the incorporated towns, and even these mainly depend upon their farms for an income.

Statesboro, centrally located, is the county seat, with a population of 2,529. It is 55 miles by rail from Savannah. It is an important residential, business, and educational center in this section. The first congressional district agricultural school is located here. Other towns in the county, all located along the railroads, are Metter, Pulaski, Register, Portal, Brooklet, and Stilson, with some others of lesser importance.

Cotton, the main money crop, finds a market at Statesboro, one of the largest of the inland cotton markets of this section of the State. All the Sea Island cotton of this section is marketed at Statesboro, this place claiming to handle one-eighth of all the long-staple cotton of the world. Other farm products find a market at Statesboro also. Turpentine, lumber, and cordwood are shipped to Savannah.

The transportation facilities are fairly good. The railroads within the county make good connections with several systems leading to all parts of the country. The Dover and Dublin branch of the Central of Georgia Railway traverses the county east and west, reaching Dover on the opposite side of the Ogeechee, 10 miles from Statesboro, where connection is made with the main line between Savannah, Macon, and Atlanta, also reaching Augusta. To the west this road makes connection with a number of lines. The Savannah and Statesboro Railway reaches Savannah via Cuyler, on the Seaboard Air Line. The Savannah, Augusta and Northern extends through the northwest part of the county to Garfield, in the adjoining county. The Register and Glennville extends from Register to Hagan and Claxton, in Tattnall County, where it connects with the Seaboard. In addition the Seaboard Air Line between Savannah and Montgomery, Ala., passes near the southern boundary outside the county and the main line of the Central of Georgia on the opposite side of the Ogeechee River. Fair passenger and freight service is maintained by all these lines.

The county roads are numerous, and the highways are being straightened and improved, there being now several miles of sand-clay roads completed. The improvement of the roads is doing much

to develop the county. The rural free delivery of mail is general, and the use of the telephone is being extended to all parts.

CLIMATE.

As no extended climatological observations have been made within Bulloch County itself, data from the nearest point, Savannah, are given here. This city lies nearer the coast and some 25 or 30 miles from the nearest point on the southern boundary of the county. In the main the data given show conditions in Bulloch County, but undoubtedly some differences in climate exist, that of Savannah being influenced by proximity to the sea.

The following table, compiled from the Weather Bureau records for Savannah, gives the mean, monthly, seasonal, and annual temperatures and precipitation, the absolute maximum and minimum temperature and rainfall, and the occurrence of frosts in spring and fall:

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

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	52	80	12	3.2	1.0	5.5
January	51	80	12	3.1	3.6	6.4
February	54	84	8	3.3	4.2	3.1
Winter	52			9.6	8.8	15.0
March	59	88	24	3.7	2.3	3.1
April	66	90	33	3.3	1.9	1.1
May	74	101	44	2.8	2.7	4.0
Spring	66			9.8	6.9	8.2
June	79	100	50	6.1	6.8	8.1
July	82	105	63	5.8	3.7	7.9
August	81	102	61	7.9	6.4	14.4
Summer	81			19.8	16.9	30.4
September	76	97	46	5.7	2.1	12.0
October	67	92	37	3.7	1.0	7.7
November	58	83	22	2.4	1.0	0.6
Fall	67			11.8	4.1	20.3
Year	66	105	8	51.0	36.7	73.9

Average date of first killing frost in fall, November 27; average date of last killing frost in spring, February 26; date of earliest killing frost in fall, November 1; date of latest killing frost in spring, April 5.

It will be seen by these records that the climate as a whole is a mild, temperate one. The winters are short and comparatively warm, being marked by only occasional cold spells of a few days' duration, when the temperature at times falls a few degrees below the freezing point, with the formation of thin ice. Only at rare intervals do even snow flurries occur. In fact, the winters are so moderate that hardy vegetables can be grown and others less hardy with slight protection, such as covering with cheesecloth or litter when unusual cold prevails. By referring to the occurrences of frost it will be seen that the average growing season is nine months. The season is sufficient to produce a wide variety of staple and special crops. Some crops can be grown on the land practically the year through, thus permitting continuous rotation, with all that that implies.

The summers are long and the temperature often high, but the county is favored by sea breezes that modify the heat considerably. The average rainfall is sufficient for crop growth and well distributed. The greatest precipitation takes place in June, July, August, and September. The mean annual precipitation is 51 inches, but there is a considerable range between the wettest and driest years.

AGRICULTURE.

The early settlers of Bulloch County, while coming primarily to occupy the lands and build permanent homes, depended largely on hunting and fishing for their existence. They settled first upon the hardwood hammock lands near the streams, clearing small patches on which they grew corn and vegetables. Of these they produced only enough to supply their needs, there being no incentive to produce more than this. The settlement of the county progressed very slowly; the population of the county in 1800, more than a quarter of a century after settlement, was only 1,913. From that time to the period following the Civil War the increase was small and gradual, the population in 1870 being only 5,610. The earlier agriculture was entirely self-sustaining and has practically continued so. One of the earliest special industries taken up was that of silk culture, which gave considerable promise at one time in all the country around Savannah, though just how much success was achieved can not be stated. Large mulberry trees, planted to produce food for the worms, are yet to be seen where the old settlements were located.

Live stock was brought in by the early settlers. Stock could graze the year through without shelter or particular care and the raising of cattle soon became important. The county was forested, the forest land being covered with wire grass, while along the streams and depressions there was a luxuriant growth of cane that afforded food for cattle and sheep. Hogs fattened on the mast, which was plentiful in

the swamps. The range was free and the stock roamed at will. The pasturage, however, was not of a character to give cattle and sheep their best development, and this, together with lack of care and with no attempt at improvement of the blood, caused the breeds to degenerate. Many of the cattle are mostly of these inferior strains. Sheep raising for wool production was most important. The census reports of 1850 show 6,844 sheep in the county and a wool clip of 12,687 pounds. In the next thirty years the number of sheep doubled and by 1890 had reached the greatest number, there being 15,728 head, shearing 31,135 pounds of wool. After 1890 sheep raising declined as the clearings encroached on the open range. The clearings of the early settlers were gradually extended to take in new areas of hammock land, as the older areas decreased in productiveness. The piney woods lands were avoided, not being considered desirable in those days.

Besides the staple subsistence crops, the growing of cotton was early taken up and by 1850 the production had reached 594 bales. The production of corn for the same year was 98,612 bushels. Other crops were oats, yielding 2,237 bushels; rice, 112,475 pounds; wheat, 766 bushels; and sweet potatoes, 60,610 bushels. Sugar cane was also grown on every plantation for family use, the total production being given as 30 hogsheads of cane sugar and some molasses.

The forest growth of Bulloch County was largely longleaf yellow pine, the areas being interrupted by ridges of hardwoods and swamps in which cypress was the main growth. These had very little value until recent years, when transportation facilities were afforded. After 1880 turpentining and lumbering became important and interest largely centered in these industries. Large quantities of turpentine were obtained. Narrow-gauge tram roads were built into the forest and the timber rapidly removed, operations being especially active between 1890 and 1900.

Prior to 1889 there was no railroad in Bulloch County, but in that year the Dover and Statesboro Railroad was completed, and this line was soon followed by others, at first built entirely for logging and lumbering, finally being improved for passenger and freight service. With the building of the railroads and the extension of clearings by removal of the timber, agricultural production began making advances, and during the last quarter of the nineteenth century the area improved has increased approximately to three times what it was in 1880. In each decade since 1880 the improved acreage has nearly doubled. In 1900 the acreage of improved land in farms was one-fourth of the total acreage.

The agriculture of the present time is more general in type than is usually found in a cotton-growing section. The main crops are cotton and corn, the former the money crop of the planter and ten-

ants. Both short-staple and Sea Island cotton are grown, the climatic conditions, the county lying so near the coast, permitting the growing of this crop. The acreage in Sea Island cotton is much larger than that devoted to Upland cotton. The acreage in 1899, as reported by the census of 1900, was 25,199 acres of Sea Island, yielding 9,077 bales, and 5,250 acres of short-staple Upland cotton, yielding 2,158 bales. Since 1900 the production of cotton has greatly increased, the combined production in 1910 of Sea Island and Upland amounting to 28,248 500-pound bales.

The acreage in corn slightly exceeds that in cotton, the census of 1900 showing 41,815 acres devoted to the crop in 1899, yielding 464,090 bushels. It is said that practically every planter and tenant produces enough, often more than enough, corn to feed his work stock and to supply meal for family use. Oats are grown and are usually cut green for hay. They are also pastured to some extent during the winter. The acreage devoted to the crop in 1899 was 3,925 acres. While the average yield is ordinarily only 10 to 15 bushels per acre, yields of over 50 bushels have been obtained.

Some wheat has been grown in the past, and there is now a tendency under pressure of high prices to increase the acreage enough to supply the home with flour. Rye is also grown, but to very limited extent, and a little barley has been sown for pasturage and for turning under to improve the soil.

Cowpeas are an important forage crop and are largely cut for hay. In late years it has been difficult to get them to fruit. Velvet beans and peanuts are also important forage crops quite generally grown. The velvet bean is grown in the corn, and after frost stock is allowed to graze on them.

Peanuts are planted for hogs, the crop not being harvested. The Georgia and Carolina varieties are the ones planted, the Virginia peanut not succeeding in this section. Sweet potatoes succeed and are grown on every farm, though the production is not much in excess of home needs.

A sugar-cane patch is found on every farm. The product is all manufactured into sirup, which is of high quality. The yield obtained is at the rate of 10 to 12 barrels per acre. It is not produced beyond the needs of local use, but the growing of sugar cane for table sirups could be extended profitably with the finding of a market. The present drawback is expense of shipping.

Rice was formerly grown, the production being at one time considerable. Upland rice only is now produced, small patches of which may be occasionally seen on the lower moist slopes. There is some prospect of rice culture being taken up again in the "flatwoods" section, where it can be produced successfully.

Every homestead has its garden producing vegetables, but trucking, excepting the production of watermelons, has not been developed as yet on a commercial scale, although the soils are suited to such crops. The growing of melons is practiced along the Savannah and Statesboro Railway in the "flatwoods" section of the county. A considerable acreage is now under cultivation, and it is increasing steadily. The average yield is about one-half carload to the acre. The melons are sold to buyers before shipment, in which way the growers avoid the losses likely to occur as the result of glutted markets or delay in shipment. The grower makes a fair profit on the crop. The Georgia Rattlesnake melon is the variety produced for shipment. Another variety, not shipping well, but of better quality, is the Kleckly. This is grown for home use.

Considerable interest is taken in pecans, and a good many orchards are being set out. There are some just beginning to bear. The soils and climatic conditions are suitable for growing this nut and the industry is promising. On nearly every farm are to be found fig trees and vines of the Scuppernong grape. Both these fruits thrive in this locality. While they are produced in profusion, no market is sought for them. Some pear trees are to be seen, the remains of orchards planted some years ago, the poor market and pear blight having soon discouraged the growers.

Great improvement has taken place in recent years in cultural methods. Many of the improved farm implements have been introduced, and their use is rapidly extending. Although a great deal of the land is turned with a small one-horse plow, the two-horse turning plow is quite common, as also are disk plows. Some subsoil plows are employed. Disk harrows are in quite common use, and weeders and cultivators with several small teeth have replaced largely the shovel plows and sweeps that were used formerly in the cultivation of all crops.

The tendency is to practice level or nearly level cultivation. Though the practice has been to give no preparation of the land except that necessary in forming the beds or ridges, there are now many farmers practicing thorough flat breaking of the fields before bedding or furrowing for the crops. It is especially necessary to prepare the land thoroughly in case of the shallower soils. Plowing should reach a little way into the clay, and subsoiling should be done in order to get a good seed bed and good tilth. Some subsoiling has been done, but it should become more common on the shallower soils. On the deeper sands subsoiling is not needed, as more harm than good would result from making the sand more incoherent than it is. Deep plowing, bringing to the surface some clay, would result in a heavier soil that would retain moisture better and remain in better tilth throughout the season.

Without exception contour cultivation is practiced, and notwithstanding the fact that the slopes are gentle, even then some erosion gullies develop. The rows of cotton and corn are laid along the contour, and occasionally on steeper slopes terracing is done, the terraces being placed for each 3 feet of change in elevation.

Cotton in general is planted on beds, but some of the planters merely open a furrow in the prepared land, so that the plants are started below the level. This can be done on the well-drained soils. The common practice is to throw two furrows together for the bed and to break out the middle to complete the bed. When rows have once been established, the practice is to form the bed each year in the furrow of the preceding year, thus alternating the location of the rows, the row this year being the middle the following year. The beds are made from 3½ to 5 feet apart, depending upon the character of the soil and the kind of cotton grown. With short-staple cotton the rows are placed from 3½ to 4 feet apart, while with Sea Island, which makes a larger plant, more space is required, the rows being 4 to 5 feet apart. The stronger the soil the farther apart the rows must be placed. The method of planting is to open a furrow in the ridge, in which the fertilizer is distributed and covered. The seed are planted some days later. Many now use the combined fertilizer distributer and cotton planter, which completes the planting in one operation. The crop after coming up is given thorough cultivation and a number of hoeings, in which thinning to a stand is done. Some employ the improved type of weeder, going over the field before the plants come up to break any crusts that may have formed. The use of the weeder is continued as long as possible. This is a much more effective method than the one generally practiced, and saves time and labor.

Corn is not so intensively cultivated as cotton. Two methods of preparing the land are common, the ridge and the furrow. In the former the seed are planted on a ridge formed by throwing two furrows together. This method is necessary when land is not well drained. In the latter a furrow is run in the unprepared field and the corn planted in this with fertilizer and covered slightly; then when the young plant is of sufficient height not to be covered in cultivating, the soil is thrown toward it, the soil burying the weeds and grass. Later applications of fertilizers are made. This method is similar in some respects to that of the Williamson plan of corn culture. The rows are commonly 5 feet apart, and rows of peanuts are often sowed between them.

A common practice is to plant two rows 4 feet apart and then leave a space of 7 feet, followed by two rows with a 4-foot interval, and so across the field. In the middle of the wide space a row of velvet beans is planted, and between the beans and corn on each

side a row of peanuts. It is said that by this practice more corn can be produced than with equal closer spacing, while the velvet beans and peanuts will improve the soil for subsequent crops. The velvet bean, being a very rank grower, almost covers the corn, making it difficult to harvest the crop. Neither the velvet beans nor the peanuts are harvested. After the corn is gathered the cattle and hogs are turned into the fields. The vines make good feed for the stock and the nuts are greatly relished by hogs, though they make better meat if finished on corn before killing. Cowpeas are also sown in the corn for the dual purpose of improving the soil and obtaining forage, the cowpeas being cut and cured for hay or allowed to ripen and the peas thrashed out. Very rarely is a crop of cowpeas turned under green for manuring purposes.

The velvet bean fruits heavily, but the seed does not ripen. Trouble is also experienced in getting the cowpeas to fruit in wet seasons, especially on the deeper soils. They make a rank growth, but do not fruit well. This is partly caused by fertilizer remaining in the soil from preceding crops. Planting late in the season often gives better results where a seed crop is desired.

Several methods are followed in growing oats. The seed is usually sown broadcast on unbroken ground and plowed under without harrowing, leaving the surface rough and poorly prepared. Some farmers are beginning to sow on properly prepared land, broadcasting the seed and covering it with a harrow. A few use grain drills. A sort of row or open-furrow method is in vogue, too, the oats being sown and covered in fairly deep furrows made by a one-horse plow 15 inches or more apart. In this case one or two cultivations are given. In general, fertilizers are not used at the time of planting, but some of the farmers apply a top dressing of nitrate of soda at some time during the winter, especially when the plants look yellow and do not appear to be making the proper growth. The nitrogenous fertilizer corrects the condition, the plants showing the improvement almost immediately.

Fertilizers are used on all crops to a greater or less extent, cotton, corn, sweet potatoes, and sugar cane always receiving an application, generally at time of planting or shortly before. Occasionally some give later applications during the growth of the crop. The fertilizers in general use have been generally of low grade, the most common formula being an 8–2–2[a] mixture which is applied to all crops on all soils. Some use a higher grade, 9–2–3, and occasionally some use a 10–2–4, but reports as to the advantage gained by the use of the more expensive mixtures are contradictory. Barnyard compost, cotton seed, or cottonseed meal is used in conjunction with the fertilizer, so that in reality the ratios are changed and the total amount of

[a] Eight per cent of phosphoric acid, 2 per cent of nitrogen, and 2 per cent of potash.

fertilizing constituents increased. Beneficial results with all crops always follow the use of barnyard compost. It especially assists the soil in holding moisture, and if a greater quantity was used it would greatly improve the physical condition of the soil. The quantity of barnyard manure made and saved is small, and in making up the compost chip dirt and any refuse are used. There is not enough made to apply broadcast, and it is made to cover the fields by distributing in the bottom of the furrow.

The home mixing of fertilizers is practiced by some, the growers buying the acid phosphate and different forms of potash separately and mixing them in the proportions they wish with cotton seed or cottonseed meal, the latter to supply the nitrogen in addition to what other elements they contain. Then, as these are slow-acting nitrogenous fertilizers, some nitrate of soda is often applied soon after planting. The practice of home mixing is gaining in favor. Cowpeas, peanuts, and velvet beans are grown for forage and for the beneficial results of their growth on succeeding crops.

The quantities of fertilizers used vary. For cotton the usual application is 150 to 250 pounds to the acre, but some growers exceed these applications. With the application of these amounts there is obtained on an average a little less than one-half bale of short-staple cotton and about one-third of long-staple per acre, though the yields vary considerably. The application for corn is usually about 150 pounds to the acre of the common 8–2–2 formula, supplemented by a handful of barnyard compost in the hill. The ordinary yields range from 20 to 30 bushels to the acre, though not infrequently larger yields are obtained with higher fertilization and better cultivation. Sugar cane is quite heavily fertilized with the ordinary grades of commercial fertilizers, supplemented by cotton seed or cottonseed meal in considerable quantity and a light application of barnyard compost. The latter, however, if used in too great quantity darkens the sirup and makes it stronger and less desirable. Kainit is not used to supply the potash constituent of the fertilizers because of its effect on the sirup. The watermelon growers use generous amounts of the higher grade fertilizers, applying about 500 pounds of a 9–2–3 or 10–2–4 mixture and supplementing these with barnyard compost placed in the hills.

In general there is a tendency to use greater quantities and better grades of fertilizer, especially on the better fields, where the results are more certain. The expenditure for fertilizers in 1899, as reported by the census of 1900, was $96,710.

Although seed selection in the past has received very little attention, there is now considerable interest awakened along this line. Particularly has this been brought out in the growing of Sea Island cotton. It has been considered necessary to get new seed from the

Sea Islands every four years at least to keep up the quality of this crop. This should be unnecessary, and some find that by careful selection of seed the yield and quality of the crop can be maintained. Effort is now being put forth to develop a strain of short-staple cotton of longer fiber, in order that the growing of Sea Island may be discontinued. Some planters selecting seed use hand gins, though the most common practice is to run the selected cotton through the regular gins first and thus keep the seed separate.

Great interest is now being taken in the selection of seed corn. The result has been a noticeable increase in yield. Seed selection of all the crops grown on a farm should be followed. In this way strains or varieties may be fixed that will fit the local conditions and that will give much better results than high-priced seeds brought from a distance, which may not find the environment of soil and climate similar to those under which they have been developed.

Cattle and hogs are to be found on practically every plantation. They are made to shift for themselves, particularly during the summer, when they roam at will through the woods and swamps. The cattle with lack of care have become stunted and run down and are of very little value. No improved breeds have been introduced. The white planters and tenants usually have some cows to furnish milk and butter for the table. These are given some feed, but are rather low milkers and of generally poor quality. The colored tenants rarely have a cow; but all raise enough hogs for meat supply and there is rarely a tenant who does not raise enough meat to supply his family. The hogs are of low grade and generally small, though the blood is being improved and the animals are of better quality than the cattle. They are made to "rustle" for existence, finding mast in the swamps; then in the fall they are turned in on the peanuts and velvet beans, and before butchering are fed for a short time on corn to harden the meat and improve its flavor.

Mules form the greater part of the work stock. They seem best adapted to the climatic conditions. There are, however, a considerable number of horses and some oxen used upon the farms.

Crop rotation is not generally practiced, though its value is recognized, especially by the more progressive planters. Cotton is quite commonly grown on the same land year after year, in some instances for long periods, and the yields are consequently decreasing or are maintained only with an increasing expenditure for fertilizers. Some attempt at rotation is made by the more careful planters, though no system is closely followed. It consists of corn, in which either cowpeas or peanuts and velvet beans are grown, the fields being planted to cotton the succeeding year. By some the cotton is succeeded by oats, sown late, cowpeas following the oats. It is generally recognized by the planters that crops succeeding legumes give better yields,

and that velvet beans, cowpeas, or some other crop of this class should always be included in the rotation as often as possible. The results would be still better if an occasional crop were turned under green instead of being grazed or cut for hay as at present. The greatest need of the soils is organic matter, and green manuring is, under the local conditions, the most feasible way to replenish it.

Since flour is so high priced wheat would be a good crop to include in the rotation, sowing an acreage sufficient to meet local requirements. Rye could be employed as a cover crop. It will furnish winter pasturage, grazing being discontinued in time to allow a growth of several inches to be turned under for green manure before giving the land to one of the staples. Crimson clover and vetch would also afford winter cover and pasturage and be beneficial to the soils. Another cultivated crop that could be employed to a limited extent is Irish potatoes or some other of the trucking crops.

By rotation the type of farming would become better balanced, and less dependence would have to be placed upon the success of one crop. Rotation would improve the soils, increasing the yields and the profits. Rotation would help to control plant diseases, such for example as the cotton wilt and oat rust. The attention of planters is being given more and more to the matter, and rotation will come to be the prevailing practice rather than the exception. No one thing will do more to advance agriculture in Bulloch County than this.

The crops of the county are grown on all the soils, though differences in adaptation are recognized. Cotton always does best on soil where the clay comes near the surface. In fact a relation between depth of clay and productiveness may be seen, the yield ordinarily decreasing with increasing depth of sand, with the same application of fertilizers. In the deeper soils the plant grows more to weed and fruits less freely. The roots of Sea Island cotton must reach the clay at slight depth to succeed best, and it is generally recognized that the Tifton sandy loam or "pimply land" is the best soil for either Sea Island or short-staple cotton, with the better phases of Norfolk sandy loam nearly as good. Ordinarily the yield of long-staple cotton is about one-half that of short staple, but on the better phases of these types often as high yields of Sea Island can be made as of Upland cotton, and since the former sells at a much higher price it is in such cases more profitable to grow. It costs more, however, to produce the Sea Island cotton. It requires more fertilizers, and the expense of picking is greater. There is a diversity of opinion as to which is the most profitable, except where the Sea Island cotton can be made to yield more than the average. It is also recognized that on the better soils, with clay near the surface, the cotton fiber is longer and stronger than that produced on the deeper sands, and is of a creamy color, while the latter is white.

Corn succeeds better where the clay is not too near the surface. A favorable depth is 12 to 20 inches, but good yields can be made upon moist soils with good management, even though the clay lies at a greater depth than this.

The sugar-cane patch is always selected with reference to moisture conditions and is most commonly found on lower slopes along the drains or depressions. It is a crop that also requires a good depth of sand. The quality of the sirup is better on the lighter soils, though the yield may be smaller. Sugar cane would succeed well as a commercial crop on the flatwoods soils.

The soils of Bulloch County have as a whole a wide crop adaptation, being suited not only to the production of the staple crops grown now, but as well to other general farm and truck crops. Practically all the vegetable crops can be grown in nearly all parts of the county. Thus there is offered a good opportunity for a varied type of agriculture.

According to the census of 1900 about one-fourth of the land in farms in Bulloch County is improved. Since this time the proportion of improved land has undoubtedly greatly increased. The average size of the farms according to the same authority is 196.8 acres, and although in this enumeration each tenancy was classed as a farm, which was not the case in the two previous censuses, there has doubtless been some actual decrease in the size of holdings. The farms vary greatly in size from small tracts of a few acres to holdings of several thousand acres.

There are considerable areas from which the timber has been removed that can be easily put in condition for farming. There are some bodies of virgin timber untouched. These are becoming more valuable every year. In the removal of the longleaf pine timber it is now the practice first to box the trees for turpentine and not to cut them for three years. The lumber from such trees, however, is not considered so good as from sound unboxed trees.

According to the census of 1900 only 55.8 per cent of the farms are operated by the owners, a considerable decrease from the number ten years earlier. The planters with a few years of unusual prosperity have been able to rent their farms and have moved to the towns to engage in business. The farms are rented to tenants, the greater part of these being negroes. Leases are conditioned on the payment of a share of the crop, which varies according to the character of the land, etc. Very rarely is land rented for a "standing rent," a certain amount of cotton. Occasionally land near towns is rented for cash, in which case as high as $6 an acre is sometimes asked. Under the usual practice an equal division of the crop is made between the owner and the tenant, the owner furnishing the land and one-half the seed and fertilizers and the tenant supplying the stock,

tools, and labor. When the landowner furnishes everything except the labor a different arrangement is made. Very little labor is hired outright on the farms for wages. By the tenant or share system the tenant's family are all employed. All the negro women and children find work during the chopping and picking seasons, a definite price per acre for chopping and per 100 pounds for picking being paid.

The cleared fields are all fenced. There being no stock law, the crops must be fenced to protect them, in order to allow stock the use of free range of the uninclosed lands. The fencing is mostly wire of several strands, high enough for the mules and cattle and close enough to hold hogs and sheep. Many planters are fencing their entire farms so as to keep their stock in, especially during the winter months. This is done for the purpose of improving the land.

The prevailing good prices received for cotton and other farm products during the last few years have put the planters out of debt and in a prosperous condition. The tenants have shared also in the general prosperity. Where the planters remain on the farm they are building commodious houses, and good barns and sheds for their stock and tools. The stumps are being removed from the fields. Land values are increasing rapidly, and lands are now selling for high prices in all the developed parts of the county. Prices range from $5 or less for undrained flatwoods and swamps to $50 an acre for well-drained areas of the better types of soil. Near towns the prices are much higher than this, the higher value being due in part to possible use for building sites.

SOILS.

The soils of Bulloch County, of which there are a comparatively large number, are typical of the Atlantic Coastal Plain. They consist uniformly of sandy soils of varying depth overlying sandy clay subsoils, and are derived from unconsolidated sands and clays of a number of Coastal Plain formations which are composed of transported sedimentary materials, laid down as offshore deposits in the sea that formerly extended over this region. These materials were derived from the erosion of land areas adjoining, the remnant of which is represented by the present Piedmont Plateau. These materials were accumulated through a long period, stretching from late Tertiary well into Quaternary time. During the time of change of these deposits into finally dry land, the sea floor was elevated and depressed probably a number of times, and during the periods of emergence was subject to weathering and erosional processes. New deposits were laid down upon the eroded surface of the former with each submergence, this accounting largely for the varying depth at which the underlying clays are found. There seems to be two groups of deposits when looked at in a broad way. The older and lower

consists mainly of mottled, red, drab, and yellow sandy clays, containing rounded gravel, the latter usually in beds or strata. The upper and younger series consists of the superficial beds of sands and immediate underlying sandy clays, generally grayish on the surface, except where modified by accumulations of organic matter and poor drainage, changing from light yellowish to yellow in the clayey substratum. The thickness of the upper deposits varies from a few inches to many feet. On the higher parts erosion has removed the surface bodily, and has either exposed the underlying red to mottled clay in small galled spots or the latter is left so close to the surface that it forms the subsoil if not a part of the soil itself.

As laid down these deposits were evidently assorted, as evidenced by the varying coarseness of the soil-forming materials, the coarser being deposited near shore and in moving waters, probably forming in some instances beach lines, while the finer were carried in suspension farther out in the sea and deposited in comparatively deep and quiet waters. This localized the deposits, but with the different periods of elevation and submergence the original arrangement was probably modified more or less. With the final emergence of the sea floor to make dry land, these deposits have in the formation of soils been further modified by the processes of weathering, erosion, and other agencies giving finally the various soils as now found. Chemical changes, particularly oxidation processes, have been active agents in weathering, affecting especially color changes. These have been dependent to a marked extent upon drainage conditions. Where drainage has been established oxidation has proceeded to produce the yellow and red colors seen in the soil and particularly in the subsoils, and where the lands have been subjected to swampy conditions or to intermittent saturation, oxidation has been only partially accomplished. In these situations the subsoils are drab colored or at most mottled with yellow and other colors, and the surface soil is dark colored and more or less mucky as the result of the accumulation of decayed vegetation. Upon differences of color, as induced by drainage conditions, the different soils have been separated into series. A group of soils having similar characteristics as to color, position, and present condition constitute a soil series, while differences in texture and depth to clay have been the basis of separation of the soil types within a series.

A further distinguishing factor is the presence of iron sandstone and claystone pebbles on the surface and in the soil mass. These occur in the higher well-drained areas, and are particularly conspicuous on certain soils. They are rounded or subangular, vary from the size of a pea to several inches in diameter, the greater number averaging the size of an acorn, and look very much like concretionary bodies, though upon examination they are found to be sand and

clay particles cemented by iron salts, without concretionary structure. They are largely of brownish-red color, with some of limonite yellow, the latter usually being rather rotten and easily crushed. The former are known as "red pimples" and the latter "yellow pimples," and they give the popular name "pimply land" to areas where they occur. Ridges where the fragments occur in large quantities are locally called "gravelly ridges" or even "stony ridges."

Twenty types, exclusive of Swamp, a nonagricultural type of soil, were found in Bulloch County, representing seven soil series. The Tifton series is represented by two types, a sand and a sandy loam. The latter type, agriculturally, is the best and most important soil in the county, as well as over much of south Georgia. The Tifton has been derived probably from more than one geological formation, under good drainage conditions; and a characteristic of the soil is the presence and abundance of the iron sandstone and claystone pebbles already mentioned.

The Hoffman series is of small extent, and is represented by some small areas of a fine sandy loam and coarse sandy loam. It occurs in high, well-drained situations, and seems to be derived from the older formation only, having the peculiarly mottled sandy clay subsoil of this formation.

The Norfolk series is the most extensive and widely distributed in the county, and is represented by the largest number of types, which range from fine sand to coarse sandy loam in texture. It seems to be derived almost entirely from the younger formation and is found under moderately good drainage conditions. The series is characterized by grayish to light yellowish soils, underlain at varying depths by yellow sandy clays.

The Portsmouth series has been derived entirely from the younger formation. The types are found in the "flatwoods" section and along streams and in bays and are characterized by dark-colored surface soils with drab-colored subsoils, caused by poor drainage conditions which have favored the accumulation of decaying vegetation in the surface soil, and by the presence of water, which has inhibited oxidation of the subsoil. Four types were separated in this series.

The Scranton series, represented by three types, is derived from the same materials as the Norfolk and Portsmouth, but under conditions of drainage intermediate between the two; the areas are intermittently wet and dry. This has resulted in a surface soil similar to the Portsmouth types, but the oxidative processes have been active enough to produce the yellow colors in the subsoil found in the Norfolk subsoils.

The Coxville clay loam is a single representative in the county of a series more fully represented elsewhere in the Coastal Plain. This type and also Muck occur in depressions in uplands.

Swamp is a nonagricultural type occurring as first bottoms of alluvial origin along the Ogeechee River and the smaller streams and branches throughout the county. At present the areas are in a more or less wet condition throughout the year and support a water-loving vegetation.

Along part of the course of the Ogeechee remnants of two former terraces lying above the Swamp remain. They were formed of alluvial materials deposited as flood plains when the river flowed at a higher level than now. Two types are found, a sand and a sandy loam, which have been correlated with the Kalmia series.

The name and actual and relative extent of each type, as shown by different colors on the accompanying map, are given in the following table:

Areas of different soils.

Soil.	Acres.	Per cent.	Soil.	Acres.	Per cent.
Tifton sandy loam	116,992	23.2	Norfolk coarse sandy loam	2,944	0.6
Norfolk sand	109,312	21.7	Kalmia sand	2,880	.6
Norfolk sandy loam	102,656	20.3	Hoffman fine sandy loam	2,112	.4
Swamp	93,504	18.6	Kalmia sandy loam	1,984	.4
Portsmouth sand	19,584	3.9	Norfolk fine sand	768	.2
Scranton loamy sand	13,120	2.6	Muck	640	.1
Portsmouth sandy loam	10,112	2.0	Portsmouth fine sand	512	.1
Tifton sand	7,552	1.5	Hoffman coarse sandy loam	448	.1
Scranton sand	6,080	1.2	Coxville clay loam	320	.1
Norfolk fine sandy loam	4,992	1.0	Total	503,680	.....
Scranton fine sandy loam	4,096	.8			
Portsmouth fine sandy loam	3,072	.6			

TIFTON SAND.

The surface soil of the Tifton sand consists of a medium to rather coarse sand to a depth of about 20 to 30 inches, at which depths it changes to a yellow, sticky, mealy, sandy loam, which in turn grades into yellow sandy clay. Often the subsoil has a reddish or reddish-yellow cast and occasionally it is red. The first few inches of the surface soil contains, generally, some organic matter, causing it to feel like a loamy sand and giving a dark-gray color when wet and a lighter gray color when dry. The material soon changes to light yellow below the immediate surface, which color continues into the subsoil, though gradually becoming a deeper shade.

Like the Tifton sandy loam, the Tifton sand contains considerable quantities of the finer grades of sand, though usually the medium and coarser grades predominate. The soil is loose and incoherent and resembles very much the surface of the Norfolk sand in color and structure. It differs, however, in having a heavy or clayey subsoil and in containing considerable quantities of ferruginous sandstone

pebbles on the surface and scattered conspicuously throughout the soil and subsoil. These pebbles are yellow and red in color.

The Tifton sand occurs scattered over the rolling part of the county in numerous small bodies, which in all form a considerable area. It occupies the rougher topographic positions on sharply rolling divides at the heads of streams and the steep slopes and knolls along streams. The surface is uneven and the areas well drained, as its position would indicate. The heavy subsoil enables it to retain moisture fairly well. Compared with any soil in the county, excepting the Norfolk sand, it is a poor soil, but with applications of fertilizer it is made to produce average yields of cotton and corn. The surface soil being deep, it gives better results with short-staple than with Sea Island cotton. Being well drained, it is naturally a warm and early soil and would be well adapted to trucking.

A large proportion of this class of land is uncleared, the forest consisting of longleaf pine and oak. These make a good growth, producing large trees of varieties that on the Norfolk sand are rather scrubby. It also produces a good cover of wire grass.

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

Mechanical analyses of Tifton sand.

Number.	Description.	Fine gravel.	Coarse sand.	Medium sand.	Fine sand.	Very fine sand.	Silt.	Clay.
		Per cent.	*Per cent.*	*Per cent.*	*Per cent.*	*Per cent.*	*Per cent.*	*Per cent.*
23386, 23392.....	Soil.....	2.6	14.9	19.5	37.9	16.2	4.7	4.1
23387, 23393.....	Subsoil.....	3.4	13.1	17.2	33.8	15.8	4.5	7.1

TIFTON SANDY LOAM.

The surface soil of the Tifton sandy loam consists of 6 to 15 inches—average depth 10 inches—of a grayish-brown to dark-gray loamy sand to moderately heavy sandy loam of medium to rather coarse texture. The subsoil is a friable sandy clay of about the color of cottonseed meal, which becomes heavier with depth and slightly reddish within 2 feet of the surface. Commonly, especially in the deeper phases, the subsoil may at first be a sticky sandy loam which may persist for some depth. Again, the stiff sandy clay may be encountered, as in the western part of the county, within 6 inches of the surface. A characteristic feature of the type is the presence of large quantities, 10 to 25 per cent, of pebbles of iron sandstone and claystone. These are known locally as "pimples," and the land on which they are abundant is generally know as "pimply land." They are rounded or subangular fragments varying in size from that of a pea to particles several inches in diameter. Most of the pebbles are about the size of an acorn. They look like concretionary bodies, but

upon examination are composed of sandy and clayey materials cemented by iron salts without traces of concentric structure. They are usually of a dark-reddish brown color. Some are yellow, and these are generally soft and readily crushed in the hand. Land carrying the red gravel is the more highly prized. The gravel is found on the surface and disseminated throughout the soil mass generally. It often occurs in layers forming a hardpan, and these may be encountered at any depth beneath the surface. A most usual depth is 18 to 24 inches. The pebbles are most abundant on the tops of the ridges where the fine soil materials have been removed by erosion, and the subsoil is found at slight depths, while on the slopes the soil becomes usually deeper and the quantity of pebbles less, until the type passes into the Norfolk sandy loam, the line of separation between these two soils being rather arbitrarily placed.

Analyses show the soil to carry considerable quantities of the finer and coarser grades of particles, the latter being sufficient as a rule to impart a more or less sandy feel, though the proportion of the finer particles is large enough to produce a loaminess in texture and to give good water-holding capacity. When wet this soil runs together, and with its varying sizes of particles fitting well together it becomes upon drying very compact and hard, from which it derives the name of "hard pimply land." The land is the most difficult to till in the county, but with the two-horse plows recently introduced it is readily handled. The texture and structure of the soil and subsoil are favorable to the maintenance of a sufficient supply of soil moisture at all times.

The Tifton sandy loam is found in the rolling section of the county. It is an extensive soil type, though occurring in numerous areas, none of very large extent. It occupies interstream areas and divides, which have flat to gently undulating tops and slope gradually toward the stream courses on each side. The surface of these slopes is smooth, though where steep they erode to some extent. The character of the surface promotes the run off of rainwater, and the type is thoroughly drained naturally. It originates from the weathering of sedimentary materials.

The Tifton sandy loam is considered the best soil in the county and is highly prized. It produces the largest crops of cotton, with minimum applications of fertilizers. It is the only soil that produces Sea Island cotton profitably, an average yield of about one-half bale to the acre being secured. It is not uncommon to obtain 1 bale or more to the acre in favorable seasons with proper cultivation. Short-staple cotton, with an average yield of about one-half bale, also gives yields of 1 bale or more under the best conditions. Corn does fairly well, but the subsoil is rather heavy and too close to the surface for this crop. On the deeper phases excellent yields are obtained. Oats

do exceptionally well, giving yields much above the general average. Velvet beans and cowpeas grow luxuriantly, and peanuts also do well. Cowpeas are more certain of fruiting on this soil than on any of the other types. So far the Tifton sandy loam has not been used for any but the staple crops, the larger acreage being in cotton. This crop is often grown year after year on the same land with no thought of rotation. Some of the better farmers are now practicing a rotation consisting of oats followed by cowpeas the same season, then cotton, followed the third year by corn, in which velvet beans and peanuts are grown between the rows. All the crops are given applications of fertilizers, larger quantities being used on this soil than on any of the other soils. There is also a tendency to use higher grade mixtures than formerly.

This soil is greatly benefited in tilth and productiveness by organic manures, such as barnyard manure. Not much of this is available, but any roughage may be used to advantage, while the turning under of green manuring crops, especially legumes and particularly the cowpeas, will give marked increase in the yields. This land was originally covered with a heavy longleaf pine forest. Some large bodies are yet uncleared. In the early days this land was avoided. It is now the most desired and highest priced. Its lowest value may be placed at $25 an acre, and near towns and railroads bodies of it will bring $50 or more an acre. Such areas are not on the market under present prosperous conditions.

The following table gives the results of mechanical analyses of the soil and subsoil of the Tifton sandy loam:

Mechanical analyses of Tifton sandy loam.

Number.	Description.	Fine gravel.	Coarse sand.	Medium sand.	Fine sand.	Very fine sand.	Silt.	Clay.
		Per cent.	*Per cent.*	*Per cent.*	*Per cent.*	*Per cent.*	*Per cent.*	*Per cent.*
23388	Soil	3.2	14.7	15.3	40.6	15.8	5.0	5.4
23389	Subsoil	4.7	12.4	12.8	32.7	12.4	4.8	20.2

NORFOLK SANDY LOAM.

The Norfolk sandy loam consists of a sandy surface soil from 12 to 30 inches deep, overlying sandy clay. The average depth of soil is about 18 inches; the texture varies from a loamy medium sand to medium sandy loam. The immediate surface soil has a grayish color, but this changes to light yellowish beneath. The upper part of the subsoil is generally a sticky clayey sand or sandy loam. This quickly grades into a mealy friable yellow sandy clay, which sometimes is slightly mottled in lower depths. The mottlings are usually drab, but brown and red occasionally occur. The subsoil is underlain

usually at a depth of a few feet by mottled red, drab, and yellow sandy clays.

The type is an easily worked soil, though moderately compact and coherent. In this respect it varies considerably, and where the subsoil comes close to the surface it is somewhat more compact and hard, like the Tifton sandy loam. As a rule it is not locally classed with the "hard land." Where associated with the Norfolk sand the type is rather loose and less coherent than the general average. In places it carries some iron sandstone and claystone pebbles, commonly found on the well-drained types, but they are not so numerous or so conspicuous as in some of the other types, the Tifton sandy loam, for instance, in which the presence of quantities of these pebbles is a distinguishing feature. The deeper soil and lighter color are, however, the main characteristics of the Norfolk sandy loam distinguishing it from the Tifton sandy loam.

The Norfolk sandy loam is the most widely distributed and most extensive soil type in the county. It is found in all parts, from the "flatwoods" section to the higher rolling uplands. The individual areas are not large, being interrupted by areas of other soil types and by swampy drainage courses, and the areas are in consequence irregular in outline. The surface configuration of the type is flat to rolling or sloping. In the "flatwoods" it covers flat or at most gently undulating areas slightly elevated above the general surrounding level. The largest areas occur on the border between the "flatwoods" and more rolling country. These begin as flat or slightly arching interstream areas and become more ridgy farther upstream, the type finally merging into the Tifton sandy loam, with which type it is associated on the lower slopes of the ridges. It also is found in higher situations, independent of other soil type occurrences.

With exceptions of the "flatwoods" areas it has sufficient slope to afford surface drainage, and, as a whole, it is a well-drained type. Where there is considerable inclination to the slope it is sometimes necessary to cultivate the fields with the contour or sometimes to resort to terracing. Its heavy subsoil assists in conserving moisture, though when the surface sandy mantle is very deep crops suffer to some extent for moisture during prolonged periods of dry weather. The materials forming the Norfolk sandy loam are of marine sedimentary origin, and are derived mainly from the younger formations of the county, though it is possible that in higher occurrences of the type the older formation has been a factor in its derivation, in the case of the subsoil, if not of the surface soil.

Agriculturally the Norfolk sandy loam is one of the important soil types of the county, being only surpassed in productiveness by the Tifton sandy loam occupying the gravelly ridges. In fact its

better phases yield almost as well as the Tifton sandy loam. It has a wide crop adaptation and is devoted to all the crops grown in the county, of which cotton and corn are the most important. Very little Sea Island cotton is grown on the type, as with its depth of sandy surface it makes too much weed. Some of it produces fair crops of cotton. Short-staple cotton does better, ordinarily giving yields of about one-half bale to the acre. The type is capable of producing higher yields than this, as much as 1 bale or more to the acre having been secured with liberal applications of fertilizer and proper cultivation. Corn makes as good yields as are secured on any other soil in the county with ordinary fertilization. By special care to matter of preparation and fertilization yields of 100 bushels or more of corn have been secured. The average yield is about 25 bushels per acre. Sugar cane is grown on the lower slopes along the streams and yields well, the quality of the sirup being good and the color light, especially on the deeper phases of the type. Oats do well, and the leguminous crops, such as cowpeas and velvet beans, grow luxuriantly. This is also a soil that is well adapted to trucking, but with the exception of producing some watermelons, it has not been used for this purpose. In the "flatwoods" section, along the railroad, watermelon growing has been developed to some extent. The average yield is one-half carload to the acre, which gives a fair profit to the grower. It would be a good soil for the growing of Irish potatoes. Sweet potatoes are now grown for home use.

Like all the better-drained soils of this section its most urgent need is the incorporation of organic matter, which can be most easily accomplished by turning under green manuring crops, especially the legumes. Velvet beans, cowpeas, and peanuts are grown. These are not harvested but grazed by live stock. This is much better than to allow the land to lie idle except when in corn or cotton, for the soil derives some benefit from the droppings of the stock, from the nitrogen stored by the roots, and from the refuse organic matter. Turning under a crop of cowpeas while green will be found more beneficial, especially with an application of lime to assist decay and correct acidity, and this should be done at least occasionally, until the fields have been built up. Having a good subsoil, although usually beyond reach of ordinary plowing, the type is one that responds readily to good treatment.

The Norfolk sandy loam was originally covered by a heavy growth of longleaf pine with occasional areas of shortleaf pine and of some of the deciduous species. A large part of the type has been cleared and is under cultivation. As a general rule the planters and tenants on this soil type are prospering, and the land is increasing in value. The present price ranges from $10 to $50 an acre, depending on nearness to towns and railroads.

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

Mechanical analyses of Norfolk sandy loam.

Number.	Description.	Fine gravel.	Coarse sand.	Medium sand.	Fine sand.	Very fine sand.	Silt.	Clay.
		Per cent.	*Per cent.*	*Per cent.*	*Per cent.*	*Per cent.*	*Per cent.*	*Per cent.*
23360, 23362.....	Soil.....	1.5	10.9	16.9	48.1	12.3	6.8	3.3
23361, 23363.....	Subsoil.....	3.6	11.8	14.5	36.2	9.1	5.6	18.8

NORFOLK SAND.

The surface soil of the Norfolk sand, to depth of 6 to 8 inches, consists of loose sand of light-gray to dark-gray color, changing to light yellowish, the surface being darkened for a few inches by the accumulation of a small amount of organic matter. In texture the material is mainly a medium sand, but it varies in this respect, being in places a little coarser and in others somewhat finer than the average, approaching in the latter case the texture of the Norfolk fine sand. The subsoil is of material similar to the soil; in fact, there is practically no line of demarcation between soil and subsoil. The latter is a medium sand, generally uniform in texture throughout the soil profile, though some exceptions occur where it may become a little coarser and carry some small rounded gravel. The subsoil extends to depths of over 36 inches; in fact, the type as separated consists of sand beds in which the underlying sandy clays are not encountered within 36 inches of the surface. Generally the sand is several feet in depth, in places being as much as 20 feet or more. In others the sandy clay may be reached at 40 inches, in which case the immediate overlying soil material carries some clay, enough to make it slightly sticky or a light sandy loam. The usual color of the subsoil is grayish yellow to pale yellow; in places it may become slightly reddish. The particles forming the sand are subangular grains of quartz, no other minerals seeming to enter into its formation.

As a whole the type is loose and incoherent, though where organic matter has accumulated or has been incorporated through cultivation the surface is somewhat coherent. After continued cultivation even this slight coherency disappears.

The Norfolk sand is one of the extensive soil types of Bulloch County. It is found in all parts of the county and forms some of the largest areas of any single soil type. It is closely associated with the drainage, occurring in almost continuous areas along the banks of the larger streams, with usually the greatest development on the eastern side. The largest areas lie along the Canoochee River and on the lower and upper courses of Lotts Creek.

In the southeastern part of the county, in the "flatwoods," the surface of the Norfolk sand areas is generally flat, but in the higher parts it becomes rolling or billowy. It also forms ridges extending from one stream to another. These ridges are locally known as "black-jack" ridges. From the streams it may rise with a gently sloping surface, but often it rises abruptly from the immediate stream banks or from the bordering swamp, from which it extends as flat, terracelike areas. As the distance from the streams increases the surface frequently changes to a rolling or billowy topography.

The Norfolk sand represents the more sandy sediment of the younger formation. Its occurrence along streams suggests the possibility that it may have been subjected to reworking by water, in which process the finer particles, as the silts and clays, were removed. Wind action also has probably modified the surface by piling up the sands into hillocks and billowy ridges.

Very little of this type is cleared and under cultivation. It is loose and leachy and is not readily improved. The characteristic tree growth is black-jack oak, with some other hardwood species and a scattering of longleaf pine. None of these attain, as a rule, any great size. However, along stream courses immense water oaks are common on this type. A scant sod of wire grass is supported, affording some pasturage for part of the year. Some areas of this type, usually flat and underlain by sandy clay within 3 to 5 feet of the surface, are cultivated. These produce fair yields of the general farm crops.

Being a well-drained, loose soil, the Norfolk sand is warm and early. It is therefore especially adapted to early, light truck crops, though heavy applications of fertilizers and manures are necessary. It gives good results with sweet potatoes, producing a potato of superior quality and fair yield. Watermelons, cantaloupes, and such vegetables as peas and beans can be matured early and no doubt with profit. Lettuce and radishes can also be produced for the earliest markets.

The ordinary yields of farm crops are sometimes made with the usual applications of 150 to 200 pounds of fertilizer per acre. Though a yield of one-half bale and occasionally more of cotton per acre is often obtained, the average yield is much lower. The usual practice is to use a fertilizer analyzing 8–2–2, and to supplement it with some barnyard manure, compost, cotton seed, or cottonseed meal. Rarely is a high grade of fertilizer used. Experience in other parts of the State has shown that a fertilizer analyzing 10–2–5 used at the rate of 400 to 500 pounds per acre in conjunction with some organic fertilizer has yielded as much as one bale of cotton to the acre. In the management of the soil the use of fertilizers is necessary. Those

brands containing high percentages of phosphoric acid and potash in proportion of two of the former to one of the latter should be selected, and the nitrogen should be supplied by using barnyard manure, compost, and cotton seed or cottonseed meal, and by turning under green-manuring crops, especially the legumes, such as vetch, cowpeas, and velvet beans. Rye and oats might be used to advantage as winter cover crops, pasturing them during winter and spring and later plowing them under.

This soil is little sought at present and consequently has a low value. When the trucking industry is developed, as it probably will be, the Norfolk sand will constitute one of the important soils of the county.

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

Mechanical analyses of Norfolk sand.

Number.	Description.	Fine gravel.	Coarse sand.	Medium sand.	Fine sand.	Very fine sand.	Silt.	Clay.
		Per cent.	*Per cent.*	*Per cent.*	*Per cent.*	*Per cent.*	*Per cent.*	*Per cent.*
23348	Soil	2.2	19.5	20.8	39.9	8.6	6.0	2.5
23349	Subsoil	2.4	14.4	22.3	43.0	9.9	5.3	2.5

NORFOLK FINE SAND.

The Norfolk fine sand consists of 10 inches of light-gray, changing to light-yellowish fine sand to loamy fine sand, underlain by light-yellow fine sand to depths exceeding 36 inches. The subsoil is usually somewhat compact, especially in flat areas, and the soil is generally coherent, though in places it is somewhat loose and incoherent.

Only a small area of Norfolk fine sand is found in Bulloch County. Some of it occurs in Brier Patch District and a few small areas in other parts. The type occupies flat to gently undulating areas all lying in positions favoring drainage. It represents the finer sediments of the younger formations of the county, and was probably deposited in comparatively quiet waters. It is associated with the Norfolk sandy loam and represents those areas where the fine sand surface exceeds a depth of 3 feet to underlying clay.

This soil is practically all in forest, the growth being mainly long-leaf pine, with some oak. In the more open areas there is an excellent cover of wire grass.

The Norfolk fine sand, because of its fine texture and good drainage, makes an excellent soil for trucking. It has a wider adaptation than the Norfolk sand.

The mechanical analyses of a sample of the soil and subsoil are given in the following table:

Mechanical analyses of Norfolk fine sand.

Number.	Description.	Fine gravel.	Coarse sand.	Medium sand.	Fine sand.	Very fine sand.	Silt.	Clay.
		Per cent.	*Per cent.*	*Per cent.*	*Per cent.*	*Per cent.*	*Per cent.*	*Per cent.*
23352	Soil	0.3	6.2	9.2	59.3	16.1	5.8	3.1
23353	Subsoil	.8	6.6	9.5	57.2	16.9	6.2	2.7

NORFOLK FINE SANDY LOAM.

The surface soil of the Norfolk fine sandy loam consists of a gray to light-yellowish fine loamy sand to light fine sandy loam, varying in depth from 10 to 20 inches. This material rests upon a sandy clay. The first few inches of the subsoil is a yellow sticky fine sandy loam, but it grades quickly into a yellow sticky fine sandy clay. Often in the lower part of the profile the normally yellow material is mottled with red. On the surface and in the soil mass are found generally some small rounded fragments or pebbles of a ferruginous sandstone. These, however, are not very conspicuous except in local patches.

The Norfolk fine sandy loam has a limited development in Bulloch County, being found only in the "flatwoods" section of the county and mostly in Brier Patch District. Its surface is flat and but slightly elevated above the stream courses. It generally slopes very gradually to the stream depressions and is not marked by any perceptible elevation above the surrounding soils. Drainage ways have been established, but the areas being flat and having little fall, the rainfall drains off slowly. Drainage is sufficiently thorough to permit of oxidation processes, though artificial drains are for the most part necessary to enable cultivation.

The Norfolk fine sandy loam consists of the finer sediments of the younger formations of the county and is closely associated with the Scranton fine sandy loam. It has better drainage conditions than the latter type.

Much of the Norfolk fine sandy loam is still covered with forest from which the marketable timber has been removed. This was longleaf pine, of which a scattering growth is left. Shortleaf pine and some of the oaks are taking possession of the land. The original growth was heavy, the trees attaining good size. Cultivated areas produce good crops, especially of corn. Cotton makes fair yields. Peanuts do well on this soil in other sections of the Coastal Plain. The type is a good general farming soil, with a wide range in crop adaptation. It responds readily to good treatment. Beyond its

use for the general crops the farmers of Bulloch County have not gone. In other sections it has proved a valuable soil for truck crops as well as for the general field crops. It is one of the finest textured soils of the county, and comparatively heavy, though as a rule easily worked. When wet it becomes compact and if improperly handled is more or less difficult to bring again into good tilth. The use of barnyard manure and green manuring crops would do much to improve the physical conditions of the soil and no one thing will do more to increase its natural productiveness.

The average results of mechanical analyses of the soil and subsoil of the Norfolk fine sandy loam are given in the following table:

Mechanical analyses of Norfolk fine sandy loam.

Number.	Description.	Fine gravel.	Coarse sand.	Medium sand.	Fine sand.	Very fine sand.	Silt.	Clay.
		Per cent.	*Per cent.*	*Per cent.*	*Per cent.*	*Per cent.*	*Per cent.*	*Per cent.*
23356, 23358.....	Soil.....	0.6	3.0	3.1	38.2	36.1	11.8	7.0
23357, 23359.....	Subsoil.....	.5	2.1	2.4	32.7	29.0	11.8	21.4

NORFOLK COARSE SANDY LOAM.

The surface soil of the Norfolk coarse sandy loam consists of a gray to light-yellowish coarse-textured sandy loam. This contains, however, a relatively high proportion of the finer grades, but the heaviness of texture is marked by the presence of enough coarse sand and fine gravel to give it a markedly gritty feel. The coarser particles are composed of white quartz, and are very conspicuous in the soil mass as well as on the surface in occasional areas. In local areas the surface may be covered with these smaller fragments and larger rounded gravel. There also occur to some extent pebbles of ferruginous sandstone. The depth of the soil mantle ranges from 15 to 30 inches, but usually is about 18 to 20 inches. The subsoil is a yellow sandy clay becoming heavier with depth and showing red and drab mottlings in the lower depths. Occasionally the clay subsoil is quite red or highly mottled with red, the type being very similar in such cases to the Hoffman coarse sandy loam, with which such areas would have been classed if extensive enough. The subsoil carries considerable coarse sand and gravel, but the greater proportion of such material is found in the first foot beneath the soil and often shows conspicuously as a gravelly stratum. When rubbed between the fingers the subsoil has a mealy feel, but in lower depths it is generally quite plastic. The surface soil is loose and incoherent and is easily cultivated.

The Norfolk coarse sandy loam is found in a number of comparatively small areas in the higher parts of the county, where it occupies

narrow, sharp, stream divides and the sharp ridges extending into the forks of streams. It forms the roughest topography in the county and its surface is very uneven and marked by knolls and depressions. Generally the areas slope sharply to the streams, though occasionally the slopes are comparatively long and gentle.

The Norfolk coarse sandy loam is of sedimentary origin, and represents probably an old stream or beach line. The general coarse texture of the surface may be due to reworking and the washing away of the finer sediments.

Though the surface soil is coarse and rather loose, this soil, because of its underlying clay, has about the same crop adaptation as the Norfolk sandy loam. In some localities it produces as well. Of course with applications of fertilizer it can be easily improved, and it maintains its productiveness fairly well. This soil needs organic matter and this should be supplied by growing crops to turn under. A large proportion of this type is covered by a good growth of forest consisting of longleaf pine and some varieties of oak. It also supports a good cover of wire grass and broom sedge. The Norfolk coarse sandy loam is a warm, early soil and therefore a desirable type for the production of truck crops, but its location at a distance from the railroads prevents its use for trucking at the present time. The general value of the land is comparatively low.

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

Mechanical analyses of Norfolk coarse sandy loam.

Number.	Description.	Fine gravel.	Coarse sand.	Medium sand.	Fine sand.	Very fine sand.	Silt.	Clay.
		Per cent.	*Per cent.*	*Per cent.*	*Per cent.*	*Per cent.*	*Per cent.*	*Per cent.*
23354	Soil	9.5	23.0	16.4	27.0	11.0	8.8	4.1
23355	Subsoil	11.1	16.9	12.4	19.0	8.5	7.2	25.0

HOFFMAN COARSE SANDY LOAM.

The surface soil of the Hoffman coarse sandy loam consists of a gray coarse sand carrying generally considerable amounts of fine and small gravel. The gravel content increases with depth, and between the underlying clay beds and the soil proper a stratum of small rounded white quartz gravel occurs. Occasionally there occur gravelly spots upon the surface. The color of the first few inches of soil is light gray to dark gray, from included organic matter, but beneath this the color is whitish or grayish white. The subsoil is a mottled sandy clay, the mottling being characteristic of the type and consisting of a variety of red colors intermingled with drab and white. The characteristic red is purplish to pinkish, though lighter and darker

shades occur. Altogether these mottlings, as shown in road cuts, give a very checkered appearance. Intermingled in the clay are considerable quantities of coarse sand and also larger fragments of quartz. When wet this clay is stiff and plastic and upon drying it becomes very hard.

The Hoffman coarse sandy loam is limited to a few small areas scattered about in the higher parts of the county, where it occupies knolls with rather steep slopes to stream depressions.

In origin it is sedimentary, being derived from marine sediments. Marked differences in material and the sharp line of separation between the soil and subsoil indicate deposition at different times and under different conditions.

Practically none of this type is under cultivation. The coarseness of the material causes it to be porous, and this, together with lack of organic matter and a position on the higher slopes where drainage is rapid, makes the type droughty, notwithstanding the presence of a compact clay subsoil. The tree growth consists of longleaf pine and some oak. The type supports a good growth of wire grass. It has a low value for agriculture.

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

Mechanical analyses of Hoffman coarse sandy loam.

Number.	Description.	Fine gravel.	Coarse sand.	Medium sand.	Fine sand.	Very fine sand.	Silt.	Clay.
		Per cent.	*Per cent.*	*Per cent.*	*Per cent.*	*Per cent.*	*Per cent.*	*Per cent.*
23342	Soil	15.7	26.5	19.7	24.9	5.2	5.7	1.9
23343	Subsoil	3.1	18.1	25.0	20.0	3.0	2.5	28.0

HOFFMAN FINE SANDY LOAM.

The Hoffman fine sandy loam occurs in small areas and is not extensive. It includes surface soils of a somewhat varying texture, ranging from fine sand or loamy fine sand to medium loamy sand. The greater part, however, consists of a light-gray to yellowish fine sand to loamy fine sand. The areas of medium sand were so small and unimportant as not to warrant separate mapping. The surface soil is underlain by a somewhat stiff, plastic sandy clay, mottled with combinations of different reds, gray, yellow, and drab. The purplish and pinkish reds predominate, though some bright brick-red mottlings are conspicuous. In places the subsoil is a friable sandy clay of uniform bright-red color, and similar to the subsoil of the Orangeburg series. If larger areas of this character had been encountered they would have been mapped separately as the latter type. The depth of the soil ranges from 4 to 24 inches, with an average of

about 15 inches. On the breaks of slopes the clay is exposed, but only in very small areas. The shallow depths of soil are found on the tops and upper slopes of the knolls, while on long slopes to stream courses it gradually deepens to 24 inches and occasionally more. Some pebbles and fragments of iron-cemented sandstone occur, but are scattering and rarely in any great quantity.

This type occupies some of the roughest topography in the higher parts of the county and is generally found along the streams, where the knolls drop off quite suddenly. Such topography is found at the heads of small short tributaries of the larger streams. Its position insures rapid drainage and the small, swampy streamway depressions owe their origin to seepage from these higher surrounding areas.

The Hoffman fine sandy loam occurs in small scattered areas throughout the higher parts of the county. As the total area is small it is not an important type. Only a small part of it is cleared, the farmers considering it a rather poor soil in comparison with other soils with which it is associated. Where used it is devoted to the general staple crops of the county, cotton, corn, and sweet potatoes. It requires, as do practically all the soils of the county, heavy applications of fertilizers, and even then gives only fair yields. The soil needs organic matter, which may be best supplied under present conditions by turning under green manuring crops and other roughage. Peanuts and velvet beans are grown with the corn crops and have a very beneficial effect. This soil is well adapted to the production of truck crops, especially where earliness of maturity is desired, but for the most part it lies at too great distances from shipping points.

The tree growth is longleaf and shortleaf pine, with an admixture of oak. In the character of growth and in general appearance and texture of the surface soil, the type resembles the Norfolk sand, but the presence of a clay subsoil near the surface makes it a better soil type than the latter. Its value is generally low.

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

Mechanical analyses of Hoffman fine sandy loam.

Number.	Description.	Fine gravel.	Coarse sand.	Medium sand.	Fine sand.	Very fine sand.	Silt.	Clay.
		Per cent.	*Per cent.*	*Per cent.*	*Per cent.*	*Per cent.*	*Per cent.*	*Per cent.*
23344	Soil	1.3	5.9	7.0	40.6	27.5	11.1	6.3
23345	Subsoil	.9	3.4	4.9	26.2	22.7	6.5	35.5

SCRANTON SAND.

The surface soil of the Scranton sand consists of dark-gray to ashy-gray loamy medium sand, changing at a depth of 3 or 4 inches to a copper-brown sand. At 8 to 12 inches is found a yellow to yel-

lowish-white compact medium sand, and this continues without interruption to depths exceeding 36 inches, though in spots, at a depth of 30 inches, the material may become a little sticky. The immediate surface where not cultivated resembles very much that of the Portsmouth sand, both soils containing a large amount of organic matter. The leachings from this have probably given the lower part of the surface soil its brownish color, though in part the color may be due to iron stain. The soil of cultivated fields has a peculiar appearance, small black specks intermingling with the ashy gray. With continued cultivation the surface tends to become much lighter colored. The subsoil is so compact that the soil auger enters it with difficulty. It is generally more or less saturated with water, except in the driest periods. Some iron crusts are found in this type, forming a sort of hardpan, an indication of its presence usually being a growth of palmettos.

The Scranton sand occurs most extensively in the Bay district where it is found in a number of typical areas. Small scattering bodies are found in the flats adjacent to streams. In the Bay district it occurs in the "flatwoods" as practically flat areas only slightly elevated above the Portsmouth soil areas lying next to the streams and bays. In consequence of its position it is very poorly drained, yet there is sufficient drainage to allow some oxidation of the subsoil, a fact that is evidenced by the yellowish color. However, when the soil is to be cultivated it must be thoroughly ditched.

The Scranton sand owes its origin to marine sediments which have existed for long ages in a condition of drainage intermediate between that affecting the Portsmouth and the Norfolk series of soils. As a result a heavy growth of vegetation has flourished and decayed upon the areas and this has left a large amount of organic matter in the surface soil as in the similar Portsmouth soils. The partial drainage on the other hand, permitting some oxidation in the subsoil, has developed the yellow color characteristic of the Norfolk series.

Only small areas within this soil type have been cleared and put in cultivation. It is considered a rather poor soil, giving only ordinary yields of cotton, though better yields of corn and oats. These results are, of course, secured with the use of fertilizers. When well drained and properly managed this soil should produce fine crops. Applications of lime no doubt would prove very beneficial, as there is little doubt that the type is more or less acid.

Under improved conditions of drainage and better management, the Scranton sand would probably prove itself a fair soil for trucking. Sugar cane should do well with liberal fertilization.

The forest growth consists largely of longleaf pine, with undergrowths of gallberry and huckleberry. The occurrence of scrub palmettos is general and conspicuous. It also supports a good cover

of broom sedge and wiregrass. The value of this land, unimproved, ranges from $3 to $10 an acre.

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

Mechanical analyses of Scranton sand.

Number.	Description.	Fine gravel.	Coarse sand.	Medium sand.	Fine sand.	Very fine sand.	Silt.	Clay.
		Per cent.	*Per cent.*	*Per cent.*	*Per cent.*	*Per cent.*	*Per cent.*	*Per cent.*
22992	Soil	0.9	16.5	28.2	37.3	7.4	7.0	2.3
22993	Subsoil	2.4	19.6	27.6	35.7	6.9	4.7	3.1

SCRANTON LOAMY SAND.

The surface soil of the Scranton loamy sand consists of 10 inches of dark-gray to black medium sand or loamy sand, the dark color being due to the large content of organic matter, which in places is sufficient to render the surface more or less mucky. Beneath this surface material, to a depth of 20 to 30 inches, is found a compact light-yellow sand to loamy sand, which, in turn, is underlain by light-yellow sticky sand to sandy clay somewhat mottled in places with yellow and drab and to a less extent with brown and bright red. The last two colors are caused by stains from decomposing iron concretions. The yellow color, however, predominates and only a slight mottling is recognized as characteristic of this type. The clay becomes somewhat heavier and more plastic with depth. The subsoil as a whole is impervious and is usually more or less saturated.

The Scranton loamy sand is most extensively developed in the "flatwood" section of the county in Brooklet District. It surrounds the bays east of the village of Brooklet and in the lower part of the county, and is associated with the Portsmouth soils and the Scranton sand. Areas are also scattered throughout the county, though these are usually narrow strips along stream courses.

The surface of the type is flat and but slightly elevated above the bays and contiguous areas of Portsmouth soils, while along the streams it occupies flat, rather wet areas. Owing to its low position and flat surface it is rather poorly drained, and as stated above the subsoil is usually in a saturated condition, except during the driest periods. Ditching is a prerequisite to cultivation.

The Scranton loamy sand consists of marine deposited sediments belonging to the younger formations of the county. These sediments have in the case of this soil been subjected for ages to swampy conditions, and the rank vegetation flourishing in moist places has decayed and accumulated in large quantities. In this respect it resembles the Portsmouth soils. Later, drainage being in part estab-

lished, oxidation processes became possible, and the yellow color of the subsoil not found in the Portsmouth, but found in the Norfolk soils, has resulted. The subsoil approaches closely that of the low-lying Norfolk subsoil. Along the streams it is possible that the Scranton loamy sand is in part alluvial or represents the original sediments reworked to some extent by water. The areas along streams are in such a wet condition that they are not utilized for growing crops. Those areas associated with the "flatwoods" have never been cleared, though the most of the merchantable longleaf pine has been removed. The larger part of the forest is now second-growth longleaf pine. There are, however, a few farms on the type. The soil produces good crops. One farmer, with applications of about 400 pounds of 9–2–3 fertilizer, secures as much as 1 bale of short staple cotton to the acre. This farm is drained with ditches and is in good condition as regards drainage. Sea Island cotton makes a very rank growth with a comparatively low yield. Corn succeeds well, giving 20 to 40 bushels to the acre. Oats also do well. After cultivating for some years, the organic matter becomes depleted and the type is very much like the Norfolk sandy loam, though not quite as good a soil. The Scranton loamy sand could also be utilized in producing truck crops, preferably for late maturity. Sugar cane does well. The areas east of Brooklet lie close to the railroad, and therefore can be profitably devoted to trucking when drainage has been established.

Uncleared areas bring from $5 to $10 an acre, but cleared fields in which stumps have been removed are held as high as $20 to $25.

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

Mechanical analyses of Scranton loamy sand.

Number.	Description.	Fine gravel.	Coarse sand.	Medium sand.	Fine sand.	Very fine sand.	Silt.	Clay.
		Per cent.	*Per cent.*	*Per cent.*	*Per cent.*	*Per cent.*	*Per cent.*	*Per cent.*
23379, 23383...	Soil.....	2.2	15.9	19.9	36.6	14.3	6.8	5.8
23380, 23384...	Subsoil.....	1.6	13.0	17.8	37.9	16.9	5.7	6.7
23385.....	Lower subsoil...	2.4	10.1	9.9	30.4	25.4	7.2	14.6

SCRANTON FINE SANDY LOAM.

A typical profile of the Scranton fine sandy loam, as with the Scranton loamy sand, would show it to be divided into three sections, the surface soil to depths of 8 to 12 inches, consisting of a dark-gray to black loamy fine sand, the second division being a brownish-yellow to yellowish-white rather compact fine sand or loamy sand with

a thickness of 12 to 22 inches, and the third section being a light-yellow fine sandy loam, somewhat clayey, grading quickly into fine sandy clay, rather plastic, and sometimes mottled slightly with drab and occasionally with red. Sometimes, however, the lower subsoil persists as a rather clayey fine sandy loam to depths exceeding 36 inches. The lower subsoil is quite commonly more or less saturated with water. The surface foot of soil contains, as a rule, a high percentage of organic matter, to which is due its dark color, and the leaching from these organic remains color more or less the immediate underlying subsoil.

The greater part of the Scranton fine sandy loam is comprised in one irregular-shaped body in the "flatwoods," between Brooklet and Arcola. There are also a few small areas along some of the stream depressions in other parts of the county. The surface of all these bodies is flat with a very slight undulation here and there. Within them there occur some very small depressions, cypress or gum bays, only an acre or two in extent. Because of its flat surface and low-lying position the soil is poorly drained and is in a more or less continuously wet condition. Before it can be cultivated to advantage drainage is necessary. During spells of excessive rainfall the region it occupies is often completely covered with water, and having only a slight fall the run-off is slow and the dissipation of the water is actually effected largely by lateral seepage and evaporation.

The Scranton fine sandy loam consists of fine marine sedimentary material of the younger formations. The materials have been subjected to intermittent wet and dry conditions favoring the accumulation of organic matter in the surface soil. At the same time there has been sufficient drainage to hasten the work of oxidation, and instead of the subsoil found beneath the Portsmouth soils we find a subsoil yellow in color and similar to that of the Norfolk series, especially where developed in lower lying areas. Up to the present time this type has not been cleared for cultivation. It was covered with a good stand of pine timber which has been cut, and now only a sparse growth of small shortleaf pine with a scattering of longleaf pine cover it. There are also some water oak. Gallberry forms the greater part of the undergrowth with broom sedge and wire grass among the smaller plants. These grasses afford fair grazing at certain seasons of the year.

When drained the Scranton fine sandy loam will prove a most desirable soil. Of the field crops, sugar cane, corn, and oats will succeed best. It is well suited to sugar cane, and this no doubt would prove a very profitable crop. It will also be well adapted to truck crops, of which a wide variety will find congenial conditions. Strawberries should do well, and it will unquestionably produce most of the light and heavy vegetable crops. Onions, celery, and

cabbage would find especially favorable conditions for growth, and such crops as lettuce and spinach should thrive. With liberal fertilization adapted to the different crops large yields ought to be secured. Occasional liming or applications of land plaster will probably be necessary to correct acidity.

The principal body of this land lies along a railroad, giving exceptional railroad facilities. This land belongs largely to a corporation, and steps have been taken to reclaim it by ditching, the plan being to dig a main drainage canal and lead laterals into it as required. This would render all the area fit for cultivation. It is the intention to develop the trucking industry upon the type. In its present unimproved condition this land is valued at $5 an acre, but it is not on the market, and will not be for sale until drainage is established.

The results of mechanical analyses of samples of the soil, subsoil, and lower subsoil of the Scranton fine sandy loam are given in the following table:

Mechanical analyses of Scranton fine sandy loam.

Number.	Description.	Fine gravel.	Coarse sand.	Medium sand.	Fine sand.	Very fine sand.	Silt.	Clay.
		Per cent.	*Per cent.*	*Per cent.*	*Per cent.*	*Per cent.*	*Per cent.*	*Per cent.*
23374	Soil	0.2	1.4	2.1	58.4	25.4	7.3	5.1
23375	Subsoil	.0	1.3	1.9	57.8	27.1	4.9	7.1
23376	Lower subsoil	.5	2.5	2.0	53.4	17.8	8.5	14.5

PORTSMOUTH SAND.

The surface soil of the Portsmouth sand consists of a dark-gray to black medium sand in which the content of organic matter is high, in places rendering it almost mucky. The depth of the dark-colored surface soil averages about 10 inches, and underlying this to a depth of 16 to 20 inches is a stratum of brown sand. Iron crusts forming hardpan are generally found in this material, though occasionally lacking.

Beneath this brown sand and with a sharp line of demarcation is found a very compact, light-drab, medium sand that often becomes white in the lower part of the profile. This compact sand usually extends to depths greater than 36 inches. So compact is the underlying material that a soil auger can penetrate it only with difficulty. It is, as a rule, in a saturated condition, and it is so impervious that the water is held close to the surface throughout the year. During wet spells water stands for considerable time on the surface of the areas of the type, as there is little opportunity for it to escape except by evaporation.

The Portsmouth sand is the most extensive type of the Portsmouth series of soils. Its greatest development is in the "flatwoods" section of the county, over which numerous areas are scattered. The largest single body lies between the forks of Big and Little Black Creeks. Smaller areas are found in other parts of the county in the forks of streams, along their courses, and in depressions or small bays in the upland. The areas, without exception, are flat or more or less depressed, and support a water-loving vegetation, among which gallberry, huckleberry, and palmetto are prominent plants. These smaller growths are characteristic of the type, as they are of the Scranton sand, with which it is often associated in the "flatwoods." Drainage in the type is effected by lateral seepage into the slightly lower bays and by outflow through poorly defined water courses.

The type owes its origin to marine-deposited sediments, which, because of position, were rendered more or less swampy and modified by the accumulation of large quantities of decayed organic matter in the surface and by the presence of water in the subsoil, which has prevented oxidation processes. The drab and white colors that characterize the subsoil of the Portsmouth series are the result of imperfect oxidation. The Portsmouth sand must be drained before it can be cultivated, and with the slight gradient obtainable this can be accomplished with difficulty. In its present condition, except for its timber growth and the grazing afforded, the land is practically valueless. None of it is cleared except where it occurs next to higher cultivated areas and has been encroached upon in forming fields in better drained soils, but the area thus included amounts to very little. Thoroughly drained, the Portsmouth sand would be a desirable soil for certain uses. It would no doubt produce good crops of corn and oats, but its especial use would be for heavy truck crops, such as onions, cabbage, etc. In the more mucky areas celery would thrive.

The tree growth consists largely of longleaf and shortleaf pine and the different gums, in the wetter places, with an undergrowth of gallberry, huckleberry, and palmetto. More or less rank growths of broom sedge and water-loving grasses afford grazing during certain seasons of the year. The land is held at a very low price at present, except where it supports forests of merchantable timber.

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

Mechanical analyses of Portsmouth sand.

Number.	Description.	Fine gravel.	Coarse sand.	Medium sand.	Fine sand.	Very fine sand.	Silt.	Clay.
		Per cent.	*Per cent.*	*Per cent.*	*Per cent.*	*Per cent.*	*Per cent.*	*Per cent.*
23367	Soil	0.4	8.7	17.9	54.2	8.5	6.2	3.7
23368	Subsoil	.7	8.7	20.7	53.3	8.3	4.6	3.4

PORTSMOUTH FINE SAND.

The Portsmouth fine sand occurs in only a few small areas in the county. Like the other Portsmouth types of soil the surface material is high in organic matter. The texture is a fine sand to a depth of 10 inches, where a close compact fine sand, the upper portion usually brown from iron stains or organic matter, is found. Beneath this the material, while having the same texture, assumes a light-drab to white color.

The type represents small areas of fine marine sediments subjected since deposition to rather poor drainage conditions.

None of the Portsmouth fine sand is cleared of the characteristic growth of pine, gallberry, and palmetto found upon this and the other Portsmouth soils.

PORTSMOUTH SANDY LOAM.

The surface soil of the Portsmouth sandy loam to depths of 10 to 15 inches consists of a dark-gray to black medium sandy loam so high in organic matter as to be in places rather mucky on the surface. The immediate subsoil is generally brown or iron stained compact sand or sandy loam, changing below to dark-drab, often mottled with yellow and passing generally at a depth of 24 to 30 inches into a rather plastic drab sandy clay also mottled sometimes with brown, yellow, and occasionally with red. In some places, however, the subsoil continues to depths of 36 inches as a sticky sandy loam. The subsoil is, as a rule, more or less saturated owing to its compact uniform character which prevents the downward movement of water.

The Portsmouth sandy loam is found in small areas in depressions in the "flatwoods" section and as strips in stream depressions and flat areas adjacent to some of the small creeks. It is widely distributed, occurring in all parts of the county, but the areas are small and the total extent unimportant.

The deposits from which the soil is derived have been subjected since they were laid down to semiswampy or intermittent wet and dry conditions. They have favored accumulation of organic matter, resulting in the mucky surface soil, while the saturated condition of the subsoil has inhibited oxidation and given the light color and mottled appearance of this part of the soil profile.

The areas are characterized by a water-loving vegetation, consisting of slash pine, black and sweet gum, and a profusion of gallberry bushes and some palmetto. In its present condition it is of no agricultural value. The pine timber is valuable for lumber and turpentine. Thoroughly drained and limed this soil would produce good crops of corn and oats. It is, however, better adapted to such trucking crops as onions, cabbage, and celery.

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

Mechanical analyses of Portsmouth sandy loam.

Number.	Description.	Fine gravel.	Coarse sand.	Medium sand.	Fine sand.	Very fine sand.	Silt.	Clay.
		Per cent.	*Per cent.*	*Per cent.*	*Per cent.*	*Per cent.*	*Per cent.*	*Per cent.*
23371	Soil	3.6	11.4	12.0	38.5	22.4	7.1	4.8
23372	Subsoil	1.9	10.6	12.7	41.9	18.1	10.4	4.2
23373	Lower subsoil	2.9	12.4	13.4	36.8	14.0	9.5	11.6

PORTSMOUTH FINE SANDY LOAM.

The surface soil of the Portsmouth fine sandy loam, to an average depth of 12 inches, consists of a black rather mucky fine sand or loamy sand. This surface stratum is underlain by a compact drab-colored fine sand, which in the upper portion may be somewhat stained with iron. This material either rests upon a heavy fine sandy loam grading into clay loam or changes, often rather abruptly, into a drab-colored fine sandy clay, the clay content generally increasing and the material being more plastic with depth.

The Portsmouth fine sandy loam is found largely in the "flatwoods," where it occupies a number of small areas. In other parts of the county it forms narrow strips in the stream depressions. The areas in the "flatwoods" are usually depressions or bays in which flourishes a water-loving vegetation, gallberry and titi being the characteristic undergrowth. Broom sedge usually covers the ground. The timber growth is mostly second-growth "slash" pine. These areas are rather wet. Even in dry times the water table is very near the surface.

As in the case of the other Portsmouth soils this type has been markedly influenced by long-continued swampy conditions favoring the accumulation and decay of large quantities of organic matter. None of this soil is under cultivation, and before it can be used for farming it will need drainage. It will make a desirable soil for trucking, being adapted especially to crops like onions and celery that require a mucky soil for best results.

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

Mechanical analyses of Portsmouth fine sandy loam.

Number.	Description.	Fine gravel.	Coarse sand.	Medium sand.	Fine sand.	Very fine sand.	Silt.	Clay.
		Per cent.	*Per cent.*	*Per cent.*	*Per cent.*	*Per cent.*	*Per cent.*	*Per cent.*
23369	Soil	0.2	2.2	5.6	38.4	35.4	9.2	9.2
23370	Subsoil	.3	1.7	4.6	31.4	35.1	7.4	19.2

MUCK.

The soil of the Muck consists of 8 to 12 inches of a black mucky loam. The subsoil consists of a stiff, plastic, black clay or clay loam, carrying a small percentage of fine gravel, coarse sand, and medium sand. Some of these coarser grades of material are also found in the soil. At a depth of 8 to 10 inches the soil is saturated with water. The largest body of Muck mapped in Bulloch County consists of a circular-shaped lake basin located in the extreme southeastern corner of the county, about 2 miles west of Olney, known as Grimes Pond.

The surface of this basin is flat and is somewhat lower than the surrounding country; consequently the drainage is poor. The mineral particles of which this soil is composed consist of fine sediments derived from the younger formations, with more or less recent lake sediments. During recent time these materials have undergone a reworking and redeposition in quiet water. Since this basin has ceased to be a permanent lake or pond vegetation has been growing, dying, and decaying, and in this way much organic matter has been added to the soil. Prior to the Civil War the greater proportion of the Muck was under cultivation. During this time drainage was effected by means of a canal cut from the southern edge of the basin westward to Caney Branch, a distance of about 2 miles, into which canal lateral ditches were emptied.

The soil was considered exceptionally valuable for corn and oats and those farmers owning lighter lands surrounding the "Bay Field" often rented a section of the latter on which they grew corn. In addition to corn and oats some cotton was also produced. After the war the expense of keeping the drainage canal open was found too great and the project was finally abandoned, and to-day none of the type is under cultivation. The remains of the drainage system are still to be seen and it could be easily reestablished.

The greater proportion of the area is at present without forest covering. On the southeastern edge of the basin there occurs a growth of pine, sweet gum, and black gum, together with a rather dense undergrowth of various water-loving shrubs.

A thick sod of grasses, principally broom sedge, which covers the entire area of the type, affords excellent grazing during the early spring and summer months.

If thorough drainage were again established the soil would give excellent yields of corn, oats, cabbage, and onions. Cotton would grow too much to weed, during the first three or four years, but if the soil were planted to corn and oats for several consecutive years, thus reducing the organic matter content, then cotton should grow successfully.

The soil is at present acid and would have to be limed. In addition to correcting acidity lime would also improve the structure of this soil by causing a flocculation of the clay particles and consequently a more thorough downward passage of water.

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

Mechanical analyses of Muck.

Number.	Description.	Fine gravel.	Coarse sand.	Medium sand.	Fine sand.	Very fine sand.	Silt.	Clay.
		Per cent.	*Per cent.*	*Per cent.*	*Per cent.*	*Per cent.*	*Per cent.*	*Per cent.*
22996	Soil	3.0	7.5	7.3	27.8	10.2	30.4	13.6
22997	Subsoil	2.7	7.0	6.7	25.7	11.4	23.2	22.8

KALMIA SANDY LOAM.

The surface soil of the Kalmia sandy loam consists of 15 inches of medium to fine sand or loamy sand. The surface ranges in color from light to dark gray, depending on the content of organic matter contained, but at depths of 8 to 10 inches it assumes a light-yellowish color. The surface material as a whole carries considerable fine sand, so that the texture approaches a fine sandy loam. But there is usually enough medium and coarse particles to give an apparently coarser texture. This surface material is somewhat coherent when pressed in the hand and in low places, where the texture is finer, it becomes quite hard and compact. The subsoil, to a depth of 36 inches or more, consists of a bright-yellow sandy clay becoming slightly heavier with depth. The sandy clay subsoil lies at depths varying from 12 to 30 inches below the surface. Occasionally small spots are included with the type in which the clay was barely touched at a depth of 36 inches, but on the average it occurs between 15 and 20 inches beneath the surface.

The Kalmia sandy loam is found in the districts of Hagan, Blitch, and Lockhart along the Ogeechee River, where it forms second terrace areas. It lies usually between the Kalmia sand, occupying the first terraces, and the soils on the upland slopes. The Kalmia sandy loam is flat to gently sloping, the surface rising very gradually from the first bottoms to the uplands. The topography does not favor drainage, and parts of the type are likely to be wet and to need ditching.

This soil is alluvial in origin, having been formed as a flood plain of the river when it flowed at a higher level than at present. It is not now subject to annual overflow. The materials comprise in part the

sediments deposited by the river and in part the wash from the contiguous upland slopes.

Very little of this type is cleared and under cultivation. It does not give good results with cotton, except in very favorable seasons. In general its productiveness is rather low, but corn and oats can be grown successfully with fertilization. The forest growth consists mostly of shortleaf pine, the trees having rather slender growth.

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

Mechanical analyses of Kalmia sandy loam.

Number.	Description.	Fine gravel.	Coarse sand.	Medium sand.	Fine sand.	Very fine sand.	Silt.	Clay.
		Per cent.	*Per cent.*	*Per cent.*	*Per cent.*	*Per cent.*	*Per cent.*	*Per cent.*
23346	Soil	3.2	11.9	13.0	43.3	18.0	6.8	3.6
23347	Subsoil	3.5	10.8	10.6	34.5	15.8	7.0	17.7

KALMIA SAND.

The Kalmia sand is a rather variable type, but consists for the most part of 10 inches of light-gray sand or loamy sand of medium to coarse texture, underlain by medium to coarse yellow sand to loamy sand, which usually extends to a depth of 3 feet or more. Often the subsoil rests at 30 inches, and occasionally at 20 inches, upon a heavy sandy clay mottled brown, drab, white, and red, the last being the most conspicuous color.

In structure the soil is rather loose and open, owing to the presence of coarse mineral particles, and in places the content of these is sufficient to make the soil coarse textured. Again, as in the sandy hummocks or bars in the river swamp, the texture is finer and the structure more compact, but this phase is of comparatively small extent.

The Kalmia sand is found along the Ogeechee River and lies on a terrace immediately adjoining the river swamp and but slightly elevated above it. During flood stages or excessive rainfalls, when the swamps and streams leading into the swamps are full of water, the water seeps into the type, rendering it very wet. In fact, the underlying sandy clay is usually more or less saturated. Owing to the low-lying position of the areas drainage is effected largely by lateral seepage, and this is only accomplished after the water level in the swamp has fallen. Thus, much of the Kalmia sand during rainy seasons is too wet to cultivate, while on the other hand its open structure makes it droughty in dry seasons. Only under the most favorable seasonal conditions of moisture are fair yields obtained.

The type owes its origin, in part at least, to reworked sediments deposited as flood plains by the Ogeechee River when it flowed at a higher level than now.

The type is not extensive, and very little of it is cleared. It is not considered a desirable soil, both on account of its low position and the necessity of drainage, and on account of its low natural productiveness. In years of moderate rainfall it will yield fair crops of cotton, but corn and oats do much better than any other crops.

The forest growth is mostly shortleaf pine with a scattering of other pine and deciduous trees. These have for the most part slender trunks. On the sandy hummocks in swamps the growth attains a larger size. The value of the soil type is low.

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

Mechanical analyses of Kalmia sand.

Number.	Description.	Fine gravel.	Coarse sand.	Medium sand.	Fine sand.	Very fine sand.	Silt.	Clay.
		Per cent.	*Per cent.*	*Per cent.*	*Per cent.*	*Per cent.*	*Per cent.*	*Per cent.*
23364	Soil	2.9	16.3	14.6	39.0	10.8	9.9	6.6
23365	Subsoil	3.8	12.9	15.3	37.3	12.1	9.1	9.5
23366	Lower subsoil	4.8	12.2	11.2	30.2	9.0	5.7	26.7

COXVILLE CLAY LOAM.

The Coxville clay loam is of minor importance, its extent being only one-half square mile. It occurs in Hagan District, in the northeast part of the county, where it ocupies a few shallow sink-hole depressions that formerly held water, but are now more or less dry. The soil, representing material that is gradually creeping toward the center of the depressions, is rather variable, the texture ranging from a clay loam in the interior of the areas to a sandy loam near the margins. The greater part of the type consists of a rather dark gray or dark drab heavy silty loam or clay loam, with a depth of about 10 inches, underlain by a bluish-drab, somewhat sandy clay, becoming mottled a few inches below the contact with yellow, drab, and brick red. The red mottling is particularly conspicuous, increasing somewhat with depth. The yellow color, however, predominates, and the drab-colored material becomes less conspicuous with depth. The drab material is quite stiff and plastic; the yellow and red materials are more sandy and have a granular structure.

The materials forming this soil consist of water-deposited sediments. At times of excessive rainfall water evidently still stands in these sinks. Portions lying next to the rim are cultivated to corn and oats, which in favorable seasons make good yields.

The following table gives the results of mechanical analyses of a sample of the heavier part of soil and of the typical subsoil of the type:

Mechanical analyses of Coxville clay loam.

Number.	Description.	Fine gravel.	Coarse sand.	Medium sand.	Fine sand.	Very fine sand.	Silt.	Clay.
		Per cent.	*Per cent.*	*Per cent.*	*Per cent.*	*Per cent.*	*Per cent.*	*Per cent.*
23340	Soil	1.3	6.8	6.8	25.5	11.2	22.5	25.8
23341	Subsoil	2.6	7.7	6.5	19.0	8.8	7.2	48.2

SWAMP.

Throughout all parts of the county are wet areas, supporting a swampy vegetation, that have been mapped as Swamp, by which term they are known locally. The Swamp occurs in two phases, one forming the low flood plains along the larger streams, and the other small undrained streamway depressions and the basin-shaped depressions known as "bays." That along the larger streams is subject to overflow, at times completely covered by water, and more or less wet throughout the year, though during the dry season the surface is comparatively dry, pools of water occurring only here and there in the sloughs and depressions. The surface is usually flat, but marked by sand bars (hammocks) and an intricate system of sloughs and lagoons.

The most extensive area of Swamp lies along the Ogeechee River and forms a practically continuous strip along its banks, varying in width from a few rods to 1 mile. The Swamp supports a heavy growth of water-loving trees, the most prominent being cypress, also swamp white oak and gum. Occasionally on the hammocks hickory and oak are found. Magnolia and bay are also characteristic species. Besides the larger growths, palmetto and gallberry and other shrubs and vines are found, especially around the margin of the areas.

The Swamp is alluvial in origin, and the sediments vary within short distances from sand to silt and clay. Areas of Muck also occur.

The remaining Swamp areas, those along branches and streamway depressions and bays, are mostly narrow strips, but there are many such areas, and the total acreage is large. Swamp areas of this class are found on most of the farms.

The surface-soil material in these areas represents the wash from adjoining slopes and is usually sandy, though the texture is modified by the admixture of large quantities of decayed organic matter, rendering some areas more or less mucky. Beneath this surface soil occurs a compact drab to whitish colored sand or a sand grading into a plastic drab-colored sandy clay. The lower subsoil even at driest

times is more or less saturated with water. The "bays" occur in the "flatwoods" section. The largest of these is Bulloch Bay in Bay District. It is a mucky to peaty swamp or semiswamp covered by dense vegetation.

Swamp in its present condition is a nonagricultural type and valued only for its timber and as a range for cattle and hogs. There is valuable cypress timber in the larger Swamp areas, but their inaccessibility makes lumbering operations difficult and expensive. Cattle find considerable feed in the Swamp areas and hogs find large quantities of mast on which they fatten.

If diked and drained the larger areas might be utilized for rice culture, but destructive floods make their reclamation uncertain of success. Some of the bays where they are of a mucky character would, if drained, be of value, especially in growing such crops as celery, cabbage, and onions. Bulloch Bay in particular would be especially valuable for such crops provided it could be thoroughly drained. The bottoms of small streamway depressions could be ditched and utilized with less difficulty than the other Swamp areas, but they are small and at present it will not pay to reclaim them.

SUMMARY.

Bulloch County is situated in the wiregrass section in the east-central part of the State. It comprises an area of 787 square miles or 503,680 acres. It is included in the Atlantic Coastal Plain and its surface configuration is flat to rolling or ridgy, the flat part, or "flatwoods," occupying the southeastern part of the county. The county lies between the Ogeechee and Canoochee Rivers, which receive the drainage waters of the county, finally reaching the Atlantic Ocean through the Ogeechee.

Settlement of the county began just before the Revolutionary war and progressed very slowly until 1880, since which time the population has increased rapidly. In 1900 it was 21,377 and in 1910, 26,464, largely descendants of the English pioneers.

The railroads within the county afford fairly good transportation facilities. The county roads are numerous and are being improved. There is a considerable mileage of sand-clay roads. Rural free delivery of mail reaches all parts of the county and telephone lines are extending to the farms.

The climate is a mild temperate one, with a mean annual temperature of 66° F. The growing season is long and all crops mature before danger of frosts. The winters are moderately cool. The mean annual precipitation is 51 inches and is well distributed throughout the growing season.

Agriculture has developed slowly and has been of the self-sustaining type. Until recently stock raising was an important adjunct to farming, then with the building of the railroads turpentining and lumbering occupied the attention of the people. With the removal of the forests and the extension of clearings agricultural production increased. Though a cotton-growing section, enough other products are grown to supply local demands. Cotton is the money crop, the production in 1910 amounting to 28,248 bales. Both Sea Island and short-staple Upland cotton are grown, the greater acreage being devoted to the former. Corn is also a staple crop. Oats are the main grain crop and are usually cut green for hay. Sweet potatoes and sugar cane are grown in small patches to supply the home, as also are garden vegetables. Velvet beans, peanuts, and cowpeas are the leguminous crops. Watermelons constitute the only truck crop grown for shipment, and the industry is developing rapidly.

The cultural methods have greatly improved in the last few years. Commercial fertilizers are used in moderate amounts with all crops, supplemented by barnyard manure composted or green cotton seed or cottonseed meal. By their use fair yields are obtained.

In 1900 about one-fourth the area in farms was improved and the average size of the farms was 196.8 acres. The tenant system is universal and only a little over one-half the farms are reported by the census of 1900 as being worked by the owners themselves.

The soils are typical of those occurring in the Atlantic Coastal Plain, and are formed from unconsolidated sands and clay laid down as marine deposits and since modified by agencies of weathering and erosion. Twenty types of soil, exclusive of Swamp, a nonagriculture type, were classified and mapped in the county. These soils fall into seven soil series. Of these the Tifton and Norfolk are the most extensive, the former being the prized "pimply lands" of this section, and are adapted for the production of Sea Island cotton.

The Norfolk series includes the types on which the great trucking industries have been developed more or less along the Atlantic Coastal Plain.

The Portsmouth and Scranton series occurring in the "flatwoods" section of the county are poorly drained and at present undeveloped. When drained they will make good soils for trucking crops as well as some of the staple field crops.

The other soil series are of small extent and comparatively unimportant. Considerable Swamp areas occur along the streams and in bays. Much of the Swamp would be difficult and expensive to drain and maintain, but some might be profitably drained in time, as along the branches and the bays, the latter having mucky soils that would be excellent for certain crops, as onions, celery, and cabbage.

The farmers are prospering under present high prices for farm products and are in a position to make improvements. They are building commodious houses and fencing all the lands, woven-wire fences being built.

Further improvements will be brought about by adopting cropping systems designed to improve the soils. Rotation in which the leguminous crops will find an important place should be followed. A greater diversity of crops would insure more certain success, reducing the cotton acreage, growing more of the other staple crops, and gradually introducing a number of trucking crops.

The live stock on the farms should be replaced by good breeds adapted to the conditions and should receive better care. Winter cover crops for pasturing should be afforded them. On the whole the outlook is promising and the county, though developing rapidly, is still capable of much greater development along agricultural lines.

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