SOIL SURVEY OF CHESTER COUNTY, SOUTH CAROLINA.

By W. E. McLENDON and G. A. CRABB.

DESCRIPTION OF THE AREA.

Chester County, with an area of 592 square miles, or 378,880 acres, is situated in the north-central part of South Carolina, well up in the Piedmont Plateau or so-called "up-country" region of the State. It is about midway between Columbia, the capital, and Charlotte, N. C. It is bounded on the north by York County, on the east by Lancaster, on the south by Fairfield, and on the west by Union. The

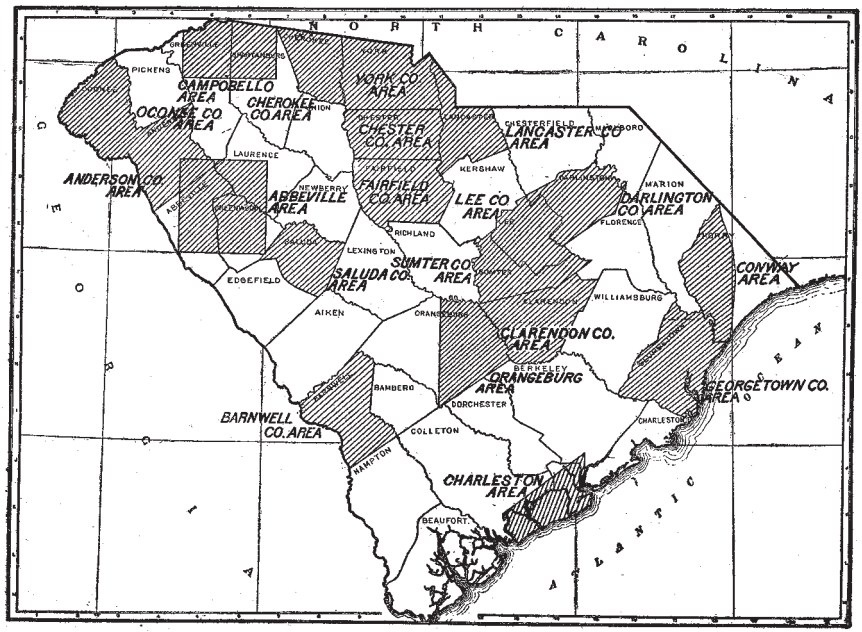

FIG. 9.—Sketch map showing areas surveyed in South Carolina.

northern and southern boundaries, about 18 miles apart, are straight lines running nearly east and west, while on the east and west, respectively, are the Catawba and Broad Rivers, which flow slightly east of south. Between the rivers the county has an average length of about 32 miles.

The topographic features, characteristic of the Piedmont region in general, are those of a high, gently sloping plain, deeply and very

much dissected by stream action. Probably in very ancient geological time the whole region now known as the Piedmont Plateau was mountainous, but as a result of long-continued erosion the mountains were worn away. Left in their stead was a low, comparatively level country, with no abrupt features, except here and there a knoll or a ridge rising above the general level. At a later period this low stretch of country was raised to a considerably higher level and tilted, so as to give a gradual southeastward slope. The mountains in the extreme northwestern part of the State, the Piedmont region through the center, and the Coastal Plain in the eastern three-fifths are very distinct physiographic divisions differing widely in geological history, character of rock, soils, and economic development.

The elevation of the Piedmont region in South Carolina ranges from 1,000 to 1,200 feet above sea level at the base of the Blue Ridge Mountains along its northwestern boundary to between 400 and 500 feet along its eastern boundary, and in Chester County from nearly 700 feet at the northwestern corner to approximately 500 feet at the southeastern corner, the trend of the slope being southeastward.

The drainage plan is dendritic. It consists of main streams flowing southeastward down the plateau slope, each made up of widely branching tributaries forming a drainage basin that has a roughly fan-shaped area, the lower part of the trunk stream forming the stem or handle of the fan. The larger streams have cut narrow valleys whose maximum depth is about 200 feet. None of them have reached the stage of a uniform grade and are consequently at some point or points still at the work of deepening their valleys. Flood plains, except local and very narrow ones, do not exist. The streams head usually in swales or mere gentle depressions on the undulating surface of the plateau. It is not an uncommon occurrence to find the stream bordered on one side by a rather steep slope and on the other by a very gradual, smooth slope extending back to the crest of the ridge. This condition may extend for some distance, or the steep and gentle slopes may alternate from side to side at frequent intervals.

While erosion has been a dominant factor in developing the present topographic features the differences in the resistance of the various rocks to weathering agencies have exercised a modifying influence. For instance, through the center of the county is a belt of eruptive rocks, principally diorite, which have weathered to a lower level than the adjoining gneiss and granite lands. This belt is characterized for the most part by level to gently rolling topography. The granite areas, on the other hand, rising 50 to 100 feet or more higher, are gently rolling to rolling and hilly. Differences due to the same cause are found also throughout the south-central and western portions of the county. Most of the eastern half of the county, however, is gently rolling, well drained and highly prized for agriculture. Large areas

of similar topography also occur in the northwestern quarter of the county. Some of the roughest areas occur in the neck between Turkey Creek and Broad River, and farther south along the river in a strip 2 to 3 miles wide and along the Catawba River and some of the larger creeks.

The drainage is about equally divided between the Catawba and Broad Rivers, forming the eastern and western boundaries of the county. A high ridge running north and south through the center of the county forms the main drainage divide. Rocky Creek and Sandy River are the two most important streams rising in the county, both having their headwaters in the north-central part. Rocky Creek, receiving the waters from numerous smaller creeks and branches, flows in a general southeasterly direction into the Catawba River at the southeastern corner of the county. Sandy River, on the other hand, flows south and southwest and empties into the Broad River at the extreme southwestern corner. Little Sandy River, Johns Creek, Brushy Fork, and Seeley Creek are the principal tributaries of the Sandy River. The more important tributaries of Rocky Creek are Little Rocky Creek, Bull Run, and Bullskin Creek. The east-central and northeastern sections of the county are drained by Fishing Creek, which rises in two forks well up in York County. Turkey Creek crosses the northwestern corner and drains a considerable territory.

The Broad and Catawba Rivers are large streams rising in the mountains of North Carolina. Their waters are impounded in many places for the development of electric power, although until recent years their importance for this purpose was not realized. At Great Falls alone, at the southeastern corner of the county, enormous power is developed and distributed to Chester, Spartanburg, Greenville, Charlotte, and other points. Another plant is located a few miles farther up the river and the Broad River is dammed at Lockhart and between the Seaboard Air Line bridge and Woods Ferry. A small power plant is located on Fishing Creek at Lando.

Settlement in Chester County began about 1750, and by the outbreak of the Revolutionary War nearly all of the lands were taken, although mostly in large holdings. The majority of the settlers came from the coast section of the State and from Virginia and consisted principally of Scotch-Irish and English, with a few French. The direct descendants of these early settlers constitute a very large proportion of the present white population, except the mill operators, who have been brought in from the mountains and other near-by sections. As there were a large number of slaveholders in the county prior to the Civil War, over half of the present population consists of negroes. The population of the county in 1910 was 29,425.

Chester, with a population of 4,754, is the county seat and only city of importance. Blackstock is a small town on the Southern Railway nearly south of Chester; Edgmoor, Lando, Richburg, Fort Lawn, and Great Falls are small towns in the eastern part of the county. Lowryville, northwest of Chester, is the only town in the western part; Lockhart is just across the Broad River near the northwestern corner. The country post offices, which were once found at frequent intervals over the county, have given way to the rural free delivery service, which reaches all sections.

The church and school facilities are ample and excellent graded schools are found in the smaller towns.

The county has an extensive system of public roads, but, unfortunately, most of these are poorly kept, and some of them are practically impassable during wet weather, a state of affairs due largely to lack of interest on the part of the inhabitants. A very large proportion of the white people live in the towns. Some of the main roads out of Chester have been macadamized for short distances, but there is still room for improvement.

The county has good railroad facilities. The main line of the Southern Railway between Charlotte, N. C., and Columbia crosses it from north to south, and the Seaboard Air Line between Richmond and Atlanta crosses it from northeast to southwest, both lines passing through Chester. A branch line of the Seaboard Air Line extends along the eastern edge to Great Falls, and Lando is on a short spur line from Edgmoor. The Lancaster & Chester Railway extends almost due east from Chester, passing through Richburg and Fort Lawn, crossing the Catawba River to Lancaster. Chester is also the southern terminus of the Carolina & Northwestern, a short line to Gastonia, N. C. It is not far across the Broad River to the line of the Southern between Spartanburg and Columbia.

The interests of the county are chiefly agricultural and cotton is the chief money crop. In the line of manufacturing there are three cotton mills, an oil mill, an ice factory, and an overall factory in Chester, and a cotton mill at Great Falls and another at Lando. Some of the cotton crop is bought by the local mills, but most of it is marketed in Chester and shipped to outside points. Chester is the main marketing and trading center, although considerable business is done in the smaller towns, including Richburg, Fort Lawn, Blackstock, Lowryville, Lando, and Edgmoor. Many of the farmers in the northeastern part of the county go to Rockhill.

CLIMATE.

The climate of the county is mild, healthful, and adapted to a wide variety of farming interests. The summers are long and hot, but except for short sultry periods the heat is not at all oppressive. The

winters are short and open, with only an occasional snowfall or sleet storm. The ground rarely freezes more than 2 or 3 inches deep. The danger from frost is generally past by the first of March and as a rule none is expected in the fall until well into October. The growing season is about 7½ months long.

The salient features of climate may be noted from the appended tables, which were compiled from the records of the Weather Bureau station at Santuck, a few miles across the Broad River, in Union County. The mean annual temperature is 61° F., although the extremes vary widely, from 105° to —11° F. The annual precipitation varies from 41.9 to 57.2 inches, the average being 48 inches. The heaviest precipitation occurs in February, which, as a rule, is also the coldest and most disagreeable month in the year. The rainfall during the summer months is well distributed for crop production. Occasional droughts, however, do an immense amount of damage, their effect being accentuated by prevailing methods of preparing the soil and of cultivation.

Normal monthly, seasonal, and annual temperature and precipitation at Santuck, Union County.

Month.	Temperature.			Precipitation.			
	Mean.	Absolute maximum.	Absolute minimum.	Mean.	Total amount for the driest year.	Total amount for the wettest year.	Snow, average depth.
	°F.	°F.	°F.	Inches.	Inches.	Inches.	Inches.
December	43	80	1	3.4	1.7	6.5	1.6
January	42	72	6	3.6	2.5	3.1	0.4
February	42	75	—11	5.6	1.0	3.2	3.9
Winter	42			12.6	5.2	12.8	5.9
March	53	85	12	4.7	4.8	4.9	0.0
April	59	92	25	4.1	4.7	6.8	0.0
May	70	101	36	2.8	0.8	5.5	0.0
Spring	61			11.6	10.3	17.2	0.0
June	77	100	46	4.2	2.2	4.2	0.0
July	79	104	52	4.5	8.5	2.7	0.0
August	78	105	53	4.9	6.4	12.3	0.0
Summer	78			13.6	17.1	19.2	0.0
September	73	100	39	3.5	2.6	6.3	0.0
October	61	89	27	3.7	3.5	0.9	0.0
November	51	80	13	3.0	3.2	0.8	T.
Fall	62			10.2	9.3	8.0	T.
Year	61	105	—11	48.0	41.9	57.2	5.9

AGRICULTURE.

Agriculture in the county dates from its settlement in 1750, progressing steadily until the Civil War. Following the war came a period of depression, from which the county is now emerging and making rapid strides toward prosperity.

Land holdings in the early days and continuing to the time of the Civil War were divided into two classes, viz, the large estate comprising thousands of acres, worked by slave labor under the direct supervision of the owner or by a paid overseer, and the small farm, worked by the owner himself and his family. The large estates were usually self-sufficient as producing plants. The small farmers grew practically the same crops as the large planters. The bulk of the crops grown in the early days were for food. Some tobacco and indigo were raised, although the latter crop was discontinued when the British Government withdrew the bounty offered for its production.

Cotton did not begin to assume importance as a money crop until after 1800, when the acreage increased rapidly from year to year until it became the chief crop. Other crops were grown in a limited way, including corn, oats, cowpeas, sweet potatoes, and hay. The cultural methods were more or less careless, the land deteriorating rapidly and being thrown out of cultivation. Such deterioration, as a rule, did not cause any serious concern, because land was cheap and plentiful, and when one field became badly run down it was thrown out of cultivation and another was cleared to take its place. While the havoc then wrought was not so distressing, some of the methods inherited from those days are proving the most serious hindrances to the agricultural progress of the county at the present time. Among these may be mentioned the immense loss of labor in operating the small one-horse plow, poor preparation of the soil, deep cultivation carried on more with the idea of exterminating grass and weeds than to conserve the moisture in the soil, and lack of rotation or the growing of crops to keep the soil supplied with humus.

The tenant or renting system found throughout the South to-day is the natural result of the economic evolution following the war. Tenants have taken the place of the earlier labor, but cotton continues to be the money crop, around which the entire economic structure is built.

The general depression following the war was reflected in the land values, which were only a fraction of what they are to-day. In other words, land now readily commanding $50 to $100 an acre was then selling for $5 to $25 an acre. The crisis was reached when cotton dropped to 4 and 5 cents a pound in the early nineties. Then there was a change for the better, and rapid strides have been made ever since.

Cotton has been bringing a fair to good price during this time. Nearly all of the land-owning farmers have paid their debts and some have become well-to-do, in many instances owning a great deal of land which they rent out. Signs of prosperity are seen in numerous new barns being built and old places better kept, in good farm stock and improved types of machinery, and in the very rapid advance of land values. The renters, consisting very largely of negroes, have not made much headway in acquiring property, but they are living better than they did 15 years ago.

On the average farm from one-half to two-thirds of the land under cultivation is devoted to cotton, anywhere from one-third to one-half to corn and a much smaller acreage to oats, cowpeas, sorghum, sweet potatoes, etc., which are grown almost entirely for home consumption. Very few cattle are found on the farms, and the majority of the farmers do not raise enough hogs to keep them supplied with pork and lard.

The census of 1910 showed 312,751 acres in farms, of which 156,133 acres were improved. The size of the average farm is given as 86.3 acres, of which 43.1 acres are improved. Farm property in the county is valued at $6,749,909, of which $4,114,197 is in land, $1,397,278 in buildings, $260,908 in implements and machinery, and $977,576 in live stock and farm animals. The value of all farm property in 1890 was given as $3,657,053.

The average value of the land was $7.11 an acre in 1890, but had risen to $13.15 in 1910. The census figures do not show the size of the farms as owned, because there are a number containing 500 to 1,000 acres or more, but they do show that more and more of the land is being operated by tenants. In other words, the majority of the white people have moved to town and rented out their farms, mostly to negroes.

From the Thirteenth Census, reporting the 1909 crop conditions, we find 61,895 acres in cotton, producing 24,249 bales; 33,830 acres in corn, producing 309,160 bushels; 5,726 acres in oats, producing 81,347 bushels; 3,024 acres in hay and forage, producing 3,526 tons; 364 acres in wheat, producing 2,801 bushels; and 686 acres in sweet potatoes and yams, producing 49,662 bushels. From the cowpeas, planted mostly between the corn rows, 6,384 bushels of dry seed were gathered. The shortage in forage is not so great as the figures above would indicate, as practically all of the corn fodder is stripped from the stalk or "pulled" and dried. It is bundled and makes an excellent forage if properly cured. Among the minor crops reported were 63 acres in Irish potatoes, producing 4,533 bushels, and 64 acres in peanuts, producing 660 bushels. A majority of the farmers grow small patches of sorghum, most of it being used in making sirup for the home table.

Of the unimproved lands, 104,149 acres are forested and 52,469 acres cleared. The cleared lands consist mostly of areas that have been thrown out of cultivation, some being badly eroded and approaching a condition of worthlessness. A large proportion of the land classed as forested supports second-growth pine and is now used for woodlots. Here and there are found patches of the original trees, consisting principally of oak, which are now very valuable.

The average yield of cotton ranges from one-third to two-fifths of a bale per acre. This is about as high as the general average for the State, but is entirely too low to make the crop profitable, especially with the present system of farming, under which it is about the only product reaching the market, and a very large proportion of the money received for the crop is spent in farm supplies. Much of the land in the county should not be used for cotton, particularly the rougher areas of the Cecil clay loam, all of the steep, gullied hillsides of other types, and the flat, poorly drained areas of the Iredell clay loam and the Durham loam. Good yields can be secured on the best areas of the Cecil, Iredell, and Mecklenburg clay loams, but their best use is for grains, forage crops, and pasturage. The Cecil sandy loam is the best cotton soil in the county and, in fact, throughout the Piedmont region of the State. It is closely followed by the Cecil coarse sandy loam, the Durham sandy loam ranking next.

Methods of planting and cultivating are very similar to those in other sections. The rows are usually from 3½ to 4 feet apart and the plants allowed to stand from 6 to 12 inches in the row. The ridge method of planting is followed, and nearly all of the cultivation is done with sweeps and scrapes, which require three to four trips to the row to complete one cultivation. Commercial fertilizers in varying quantities are used on all types of soil, the application usually being made just before planting time in a center furrow, over which the seed bed or ridge is formed.

The average yield of cotton could be doubled by adopting scientific methods. First, the soil should be deeply broken and thoroughly pulverized; the planting should be done as nearly on level ground as possible, so that the cultivation can be done with weeders, harrow, and cultivators instead of by the 1-horse plows now used. More humus should be supplied to the soil through manures and by including, in a carefully planned rotation, one or more legumes.

Next in importance to cotton is corn. While it is grown extensively and on every farm, only a small proportion of the farmers grow enough to meet their own needs. A large majority of the tenants are out of corn before January and have to buy it through the spring, summer, and early fall months. This certainly means unprofitable farming and that in the majority of cases the farm stock is poorly fed. Yet there is no particular excuse for this condition

except the lure of ready money in cotton. Almost any of the lands in the county will produce good crops of corn. Soils that will produce three-fifths to 1 bale of cotton to the acre will easily grow 50 bushels of corn and with less fertilizer. Not only that, but heavy crops of cowpeas can be grown in the corn middles. If picked, the peas are worth from $2 to $2.50 per bushel; or if not picked they can be grazed off by hogs and the vines plowed under to improve the soil.

Wheat is not grown to any extent now, although it ranked as the third and fourth most important crop until after 1900. Since then the high price paid for cotton, the prevalence of rust and the Hessian fly, etc., have caused the farmers to turn to other crops. The Cecil, Iredell, and Mecklenburg soils, if brought to a high state of cultivation, could produce good crops of wheat. To avoid the Hessian fly it would be well to defer planting until after the first killing frost.

Oats, now ranking as the third crop in importance, are grown mostly on the farms operated by the owners; in other words, by the best white farmers. Any of the soils in a good state of cultivation, except the lightest sandy types, will produce profitable crops of this grain. The average yield at present is very low, owing largely to the fact that the land used is in a poor state of cultivation and drainage.

Very little rye is grown. It should be used extensively as a winter-cover grazing crop. When allowed to mature it generally gives the best results on the light sandy soils.

Cowpeas do well on any of the soils. They are not grown as extensively as they should be, either for seed or forage or as a green manuring crop. Many other legumes do well, but are not grown. Among these may be mentioned vetch, soy and velvet beans, and red and crimson clovers.

Alfalfa has attracted some attention as a forage crop, although only a few attempts have been made to grow it. The requirements of the crop are not very well understood, so the few attempts made have not proved very successful. The first requisite is a well-drained soil, not too sandy nor tenacious, well cultivated, and containing a good supply of lime, either naturally or by application. With careful preparation good crops of alfalfa could be grown on the best areas of the Iredell and Mecklenburg clay loams.

Patches of sweet potatoes are found on nearly every farm and as a rule the yields are large. Among the other minor crops grown principally for home consumption are sorghum, garden vegetables, and Irish potatoes. A great variety of vegetables do well, although the best soils for the purpose are the sandy types of the Durham and Cecil series. Both Irish and sweet potatoes give best results on the sandy soils.

No attention is given to the growing of fruit aside from the few apple, peach, and other trees in the home orchards. There is no reason why all of the farmers should not have an abundance of good fruit from early summer until late fall. The Cecil coarse sandy loam and the sandy loam, also the Durham sandy and coarse sandy loams, are especially adapted to peaches and will grow good pears, apples, cherries, figs, grapes, and a variety of berries.

Dairying and stock raising could be made important industries, although at present not followed to any extent. Probably in no other line does the county offer better opportunities. Good, clean springs and streams are found in all sections of the county and the necessary feed and pasturage can be provided at a very low cost. There is an abundance of land in the county that can be used to better advantage for forage crops than for anything else.

Some cattle should be kept on every farm to take care of the roughage that can not very well be marketed. Beef commands a good price in the local market. The raising of hogs, too, can be made a profitable industry and at least a supply for home use should be raised. In 1910 there were but 10,442 cattle and 8,200 hogs in the county, an average of not much more than 1 cow and 1 hog to the family. About half of the cattle reported are milch cows and the other half consists of steers, calves, and bulls.

The systematic rotation of crops or the adaptation of the different soils to different crops has not received much attention with a vast majority of the farmers. Very often it is the case that cotton is planted continuously on the same land for a long period of years. Naturally the soil becomes depleted in vegetable matter and correspondingly less productive unless heavy applications of fertilizers are made from year to year. Some farmers have begun the rotation of crops and find it profitable, not only from the immediate returns, but from the general improvement of the soil. Some alternate cotton with corn; others follow corn with oats, planting cowpeas after the oats, then the next year plant cotton or corn. To make this rotation more complete it would be well to plant peas in the corn rows at the last plowing and follow the pea crop on the oat stubble land with rye or vetch or a mixture of both for a winter cover crop. The cover crop should be plowed under early in the spring and the land prepared for cotton. There are several rotations that can be followed to advantage, but in all of them cowpeas and other legumes should play an important part. All of the soils are deficient in humus, a fact accounting in a large measure for their low state of productiveness.

Commercial fertilizers have been considered a requisite in growing cotton for a long time, but within the last few years there has been

a marked increase in their use. More of them are being used for cotton and their use is now becoming general for corn and most of the other crops grown. From 1880 to 1900 the yearly expenditure for fertilizers ranged from $60,000 to $70,000, while since 1900 there has been a rapid increase in their use, the amount expended for this purpose in 1910 being $169,924. Used in the way they are now it is doubtful if the increased returns justify such an enormous expense. The bulk of it may be charged against the cotton crop, as scarcely an acre is planted without an application of fertilizer, ranging from 100 to 600 pounds, the average being about 200 pounds to the acre. The low-grade complete fertilizers (8–2–2 and 8–2–3) are extensively used. Others use a high-grade fertilizer, bought already mixed, or order a mixture of cottonseed meal, acid phosphate, and kainit. It is recognized that the red clay soils and those with a red clay subsoil near the surface do not require heavy applications of potash. A mixture of cottonseed meal, acid phosphate, and kainit has proved a good corn fertilizer. Some apply only the meal or the meal and acid phosphate mixed, applications ranging from 100 to 400 pounds to the acre. Some also make light applications, usually acid phosphate or a low-grade complete fertilizer, for wheat and oats. Sodium nitrate used as a top dressing for these crops often gives remarkable increases in the yields. In general it may be said that commercial fertilizers give the most satisfactory results on the soils kept well supplied with humus and in a good state of cultivation instead of those deficient in humus and in a badly run-down condition. If the farmers would bear this fact in mind there would be some radical changes in the present system of agriculture, and for the better.

Labor available for hire is growing scarcer every year, owing in a large measure to the present system of tenancy. Generally the negroes with families prefer to rent some land and farm for themselves to hiring out by the month for wages. In this way they can control their time, even if they do not make more than enough to pay the rent. The trouble with the majority of farmers requiring hired labor is that they are trying to operate on too extensive a scale. If they would restrict their efforts to a smaller acreage and practice better methods the scarcity of labor would not be felt so strongly. While there is a scarcity of labor in the spring and summer months, usually no trouble is experienced in the fall in getting hands to gather the cotton. The daily wage for ordinary farm work ranges from 75 cents to $1. Hands hired by the month are furnished a house and garden and board or rations and receive from $12 to $18. The cotton is picked for a stipulated amount per hundredweight, usually 50 cents. In the census for 1910 1,341 farmers reported expenditures for labor aggregating $125,747.

Counting the tenant holdings as farms, 74.7 per cent of all the farms in the county are operated by renters. Of the 2,705 tenant farms in the county 518 are operated by whites and 2,187 by negroes. Several systems of tenancy are in vogue. Cash tenants, however, are the most numerous. For a 1-horse or larger farm, as the case may be, the tenant obligates himself to pay so much cash or a stipulated amount of lint cotton when the crop is gathered. Usually the amount charged is the equivalent of an acreage rent of $1 to $5 for the lands under cultivation. Share tenancy is also very popular. Under this system the landowner may furnish a house and get one-third or one-fourth of the crop. Or if he furnishes land, house, horse, equipment, and fertilizers he gets from one-half to two-thirds of the crop. There is also a mixed system under which the landowner gets a share of the crop and a stipulated amount in cash.

The size of the farms varies from 50 to 1,000 acres or more, the average being between 150 and 500 acres. Some of the larger plantations are divided into a dozen or more tenant farms. It is on account of these numerous tenant farms that the average size of the farms as given in the 1910 census report is given as 86.3 acres.

Land values are still very reasonable in the county, although they have been advancing rapidly in the past 10 years. In 1910 the average value as reported in the census was $13.15. This is nearly double what it was in 1900; but in Anderson and some of the other Piedmont counties the average values are more than double what they are in Chester, owing largely to better improvements. The Cecil sandy loam can be bought for $20 to $50 an acre, except near town, where it commands as high as $75 an acre for some of the choicest tracts. From this the values grade downward to as low as $5 and $10 an acre for some of the roughest areas.

The agriculture of the county has advanced wonderfully in the past 15 years, especially among the landowning class of farmers, but there are practices in operation which will have to be greatly improved upon or done away with before anything like the possibilities afforded can be realized. For one thing the farmers are sticking too close to the one-crop system of growing cotton as the only money crop and giving little or no attention to the growing of other crops needed on the farm and the raising of cattle and hogs. This system is not only hazardous, in that it leads from prosperous to very lean years alternately, but the land is badly abused and kept in a low state of productivity. Hill slopes should be carefully terraced to prevent erosion and surface ditches built to care for the run-off. Farmers should make a close study of the requirements of their soils in the line of tillage and cultivation and their fertilizer requirements for the different kinds of crops grown. The scarcity of labor could be offset to a very large extent by the more extensive use

of improved implements and machinery. Cotton should be grown more as a surplus crop, devoting the bulk of the land to crops which can be fed or used on the farm.

The greatest handicap to the development of the section is the present system of tenancy. The negro tenants make no effort to keep the soil in a productive state, and as a result of their slipshod methods the soil is becoming badly run down and an increasing acreage is being practically ruined by erosion. It is safe to say that a large proportion of the fifty-odd thousand acres of unimproved land without timber in the county consists of lands once under cultivation, but now badly washed and gullied and of scarcely any value. Conditions among the tenants could be greatly improved if the landowners would supervise their efforts and encourage them to practice better methods. Better still it would be to encourage settlers to come into the county, allowing them to buy 25 to 150 acre farms on reasonable terms.

SOILS.

Chester County includes 15 types of soil. These fall naturally into two groups—the residual soils of the uplands and the alluvial soils or overflow bottoms along the creeks and rivers. Fourteen of the types mapped are of the upland group. The alluvial lands are limited in extent, of a very mixed nature, and as a rule so wet as to be of little value for farming. Besides, they are subject to frequent additions of material and changes by overflows. For this reason it was not deemed advisable to attempt any separation of the bottoms upon a basis of textural differences, but rather to classify the material collectively as Meadow and to bring out the important characteristics and variations in the descriptions.

The upland soils have been formed in place by the disintegration and decomposition of the underlying rocks, which are mostly of a highly crystalline nature. Granites and gneiss are by far the most extensive of the soil-forming rocks, although there are several others of importance, including mica schists, diorite, and gabbro. The eastern half of the county is occupied very largely by a gray, massive to schistose gneiss, the same as found extensively all through the Piedmont Plateau region. At the northeastern and southeastern corners of the county the gneiss gives way to extensive areas of a gray, coarse to medium textured granite, and in several isolated areas to granites, diorite, gabbro, and other rocks. Along the southern edge, extending some 9 miles west from Blackstock, is a body of fine-grained gneiss and gneissoid schist, and near the southwestern corner are two areas of a very light-gray, highly siliceous granite.

Through the central part of the county, extending from the York County line north of Lewis Station in a southwestern direction to the Broad River at Leeds, is an irregular strip where dark basic rocks, such as diorite and gabbro, predominate, although these are interrupted in places by lighter colored granites. Among the granites here may be mentioned a small body of a pink rock occurring 3 to 5 miles north of Chester. Extending east from this point is a light-gray granite rendered porphyritic by numerous coarse quartz crystals. Similar to the strip through the center of the county are several isolated areas in the eastern part surrounded by gneiss, a large area along Little Sandy River, and a narrow strip paralleling Turkey Creek. Passing west of the Sandy River granite is the dominant rock. A wide belt through the northwest-central part of the county is occupied by a gray granite, even textured in places, but more generally coarse porphyritic, with large crystals of feldspar. Both medium-grained granite and gneiss are found in the northwestern corner west of Turkey Creek.

The variations in the rocks have an important influence upon the resultant soils. As the rocks become more highly siliceous or acidic in their properties the tendency is more toward light-gray sandy soils with gray to yellowish sandy clay subsoils. Generally those soils with a high percentage of iron-bearing minerals will give red to brown soils with red clay subsoils and some of those of a darker basic nature, with a large percentage of hornblende, give brown or brownish-gray soils with yellowish-brown, dingy-brown, or greenish-olive, very tough, plastic clay subsoils. Then between these with such striking peculiarities are soils intermediate in color, texture, and structural properties. Differences in drainage conditions may also have an important influence upon the color and structure of the soil and subsoil. For instance, a rock that gives a yellowish or yellowish-brown clay where only fair drainage conditions prevail may give a reddish-brown to red clay under the best drainage conditions. Again, the slightest amount of seepage will cause the subsoil clay to be yellow instead of red. Whatever the cause of such differences, they have an important influence upon the agricultural value of the land. To cover the broader differences in the soils as indicated by their differences in virgin color and structural properties six series or subgroups were recognized; namely, the Cecil, Durham, Iredell, Appling, Worsham, and Mecklenburg. Each series is further divided into types based upon differences in texture or mechanical composition of the soil-forming material, some of the types occurring in two or more phases.

The Cecil series, which is by far the most extensive in the county as well as throughout the Piedmont Plateau region, is characterized by gray, brown, and reddish-brown soils, with brick-red clay sub-

soils. The coarse sandy loam, sandy loam, fine sandy loam, loam, and clay loam of the series were mapped. The sandy loam, more extensive than any other type, is derived from gneiss and in a more limited way from medium-grained granites. The coarse sandy loam, also an important type, is derived from coarse-grained porphyritic granites, found principally in the west-central part of the county. The fine sandy loam is from fine-grained gneiss and schist; the loam is from a pink-colored granite with a high content of feldspar, and the clay loam is largely the result of erosion through the other types of the series.

The Durham series includes light-gray to gray soils with yellow or brownish-yellow friable clay subsoils, generally derived from granites. In this series the coarse sandy loam, sandy loam, and loam were recognized and mapped. The loam is derived from a pink granite, the same as gives rise to the Cecil loam, owing its difference to less perfect drainage. The sandy loam is from a gray, medium-grained granite, possibly modified in small areas by gneiss and the coarse sandy loam is derived from coarse porphyritic granites.

Only one type of the Worsham series, the sandy loam, was recognized. This is a very light-colored type, derived from a light-gray highly siliceous granite. Unlike the Durham sandy loam the subsoil is gray, with gray and yellow mottlings, and the parent rock in a partially weathered condition comes within 3 feet of the surface.

The Appling series is made to include gray to light-brownish soils with yellowish-brown to brownish-red subsoils. The subsoil may be uniform in color or show some mottling, especially below a depth of 2 feet, and soft weathered rock may come within 3 feet of the surface. The color of the soil and both the color and structural properties of the subsoil are intermediate between the Iredell series on the one hand and the Cecil on the other. Only the sandy loam was recognized and mapped. It is derived from a gray granite.

The Iredell series includes brownish-gray to dark-brown soils with dingy yellowish-brown, and in some places greenish-drab or greenish-yellow, tough, plastic clay subsoil. Partially weathered rock is usually encountered at a depth of 2 or 3 feet. The soils of this series are very distinct from those of any other series and easily recognized. The series is represented by the coarse sandy loam, sandy loam, and clay loam. The clay loam is an important type derived from diorite and other dark hornblendic rocks.

Through the Iredell clay loam belt there are some areas, principally the higher knolls and best drained hillsides, where the oxidation of the soil material is more complete than in the Iredell clay loam. The soil is reddish-brown and the subsoil a reddish-brown to red to a depth of 18 to 24 inches. The clay may be underlain directly

by a partially decomposed rock or there may be layers of a tough yellow-brown clay, as in the subsoil of the Iredell clay loam. Such areas are mapped as the Mecklenburg clay loam.

The names and the relative and actual extent of the different types encountered in the survey of the county are given in the following table:

Areas of different soils.

Soil.	Acres.	Per cent.	Soil.	Acres.	Per cent.
Cecil sandy loam	113,280	29.9	Durham sandy loam	6,528	1.7
Cecil clay loam	80,384	21.2	Durham coarse sandy loam	3,264	.9
Iredell clay loam	61,440	16.2	Mecklenburg clay loam	2,880	.8
Cecil coarse sandy loam	48,000	12.6	Worsham sandy loam	2,752	.7
Meadow	22,528	6.0	Iredell coarse sandy loam	1,472	.4
Appling sandy loam	17,600	4.7	Cecil loam	1,280	.3
Cecil fine sandy loam	9,792	2.6	Durham loam	704	.2
Iredell sandy loam	6,976	1.8	Total	378,880	.....

CECIL SANDY LOAM.

The soil of the Cecil sandy loam, to a depth of 4 to 6 inches, is a brownish-gray to light-brown, medium-textured sandy loam. This may be underlain directly by a red brittle to slightly crumbly clay, or, in the deeper phases, by a subsurface layer of sandy loam extending to a depth of 8 to 12 inches, and this in turn by the typical red clay. Usually the clay is most friable near the surface, becoming more compact until a depth of 4 or 5 feet is reached. It then begins to get lighter in color and less plastic and grades finally into soft, partially decomposed rock. Frequent quartz veins that intersect the parent rock are still largely intact through the subsoil clay, some of them being exposed in road cuts. Those reaching the surface have broken up, with the result that fragments of quartz are present here and there in varying amounts. The more level areas are, as a rule, comparatively stone free, but the steeper slopes, where the surface has been lowered by erosion, and numerous strips following out the thicker quartz veins are strewn with quartz fragments.

Erosion is more or less active throughout the type, so that in every field there may be all phases from that having the deepest sandy loam surface soil to areas having clay within 4 to 6 inches of the surface. There are also numerous small areas, or so-called "gall spots," where practically all of the sandy soil covering has been removed. On a much larger scale, areas that originally had a good sandy loam soil have since been reduced to the Cecil clay loam by surface wash. The destruction by erosion is still going on, and many areas, as a result of deep gullying, are approaching a condition of worthless rough gullied land.

The Cecil sandy loam is the most important soil in the county, both in point of extent and agriculturally. Its most extensive development is in the eastern part of the county, where it extends almost uninterruptedly over a gently rolling, picturesque stretch of country. Other smaller areas, with the same characteristic gently rolling topography, occur in the western part of the county, mainly in the fork formed by Turkey Creek and the Broad River and south of Turkey Creek, extending to Chalkville.

The natural drainage of the type is perfect, and through the larger areas there are numerous creeks and smaller streams that flow the year round.

The type is of residual origin, from granite and gneiss. These rocks, as a rule in soft, partially decayed condition, are found at depths of 10 to 30 feet below the surface. It is this soft underlying material that makes erosion so destructive once it is reached. Being practically incoherent, it easily washes out and undermines the overlying clay. On the other hand, it has a beneficial effect in giving the best of underdrainage. The larger areas in the eastern part of the county are derived for the most part from a gray, massive gneiss or gneissoid granite. Some of the areas near Great Falls and at the northern edge of the county east of Edgmoor are derived from a light-gray granite, as are also the areas in the western part of the county. The granite areas are characterized by a somewhat lighter colored soil and subsoil than those from gneiss, and they are not considered quite as productive.

Some of the more important areas of the deep, sandy loam phase are found at the extreme northeastern corner of the county, occupying a very gently rolling section and extending along the drainage divide north of Landsford.

The Cecil sandy loam originally supported a heavy mixed growth of red, white, and other species of oak, hickory, shortleaf pine, dogwood, and other hardwoods. Small areas here and there are still in the original forest, but most of the type is cleared and under cultivation. It is used extensively for cotton, which is the most important crop. Corn ranks next, while oats, wheat, sorghum, sweet potatoes, and cowpeas are grown to a limited extent. The sandier phases are well adapted to vegetables and potatoes, though little effort is made in this line. Peaches can be grown successfully, as can apples, pears, grapes, cherries, and strawberries. Dairying and the raising of beef cattle, hogs, horses, and mules are industries that could be profitably extended or taken up as an adjunct to a system of mixed farming.

Yields are quite variable, depending upon cultural methods. A large proportion of the type is worked by negro tenants, who make very little effort to keep the soil in a productive state. With them, as with others following such careless methods, the average yield of

cotton is between one-third and one-half bale and of corn from 10 to 20 bushels per acre, yields of other crops being correspondingly low. The best farmers, with some attempt at rotation of crops and the more judicious use of commercial fertilizers, find it easy enough to grow from three-fourths of a bale to 1 bale of cotton and 25 to 50 bushels of corn to the acre. Wheat gives light to fair yields. As now generally handled the type is not suited to wheat, but if plowed deeper until a deep loamy soil is formed there is no reason why it should not grow good crops of both wheat and oats. Grains, too, should give satisfactory yields on such a soil.

The main problems in keeping this soil in a productive state are proper terracing to check erosion, deeper breaking every year until a loamy soil from 8 to 10 inches deep is formed, and the rotation of crops to maintain the supply of humus. When this is done there will be less need for commercial fertilizers, even for the production of cotton, which is not now grown without it. Continuous shallow cultivation is responsible for much of the destruction now wrought by erosion.

Crops on this type do not seem to require as much potash as on the lighter types. Nitrogen should be supplied largely by growing such crops as cowpeas and vetch.

CECIL COARSE SANDY LOAM.

The soil of the Cecil coarse sandy loam is a gray to light-brownish coarse sandy loam from 6 to 10 inches deep. The subsoil to a depth of 3 feet or more is a red, slightly friable or brittle clay, carrying an appreciable amount of coarse quartz sand, and in most areas partially decomposed crystals of feldspar ranging up to an inch in diameter. In typical areas the subsoil has a pronounced red color, but throughout the type are large and small areas where it varies to a lighter red. Small spots (too small to map) of the Durham coarse sandy loam and sandy loam with a yellowish-brown color in the subsoil are of common occurrence.

The type is stone-free except for an occasional bowlder or a local outcrop of the parent rock and a sprinkling of quartz fragments on the surface. The soil is friable and fairly retentive of moisture, though deficient in humus. Under a careful system of soil management it can be kept in a highly productive state.

The Cecil coarse sandy loam is an important type, occurring most extensively in the western part of the county. A large belt of it extends from the York County line north of Lowryville in a southwesterly direction to beyond Baton Rouge. Other important areas occur north of Chester and through the eastern part of the county, associated with the Cecil sandy loam.

The topography is gently rolling to rolling and hilly and all areas have good natural drainage. In fact, the surface drainage is excessive, except on the smoothest areas, and a great deal of damage is being done by surface wash, which leaves exposed the raw, freshly exposed clay or gall spots, shallow gullies, and in places even deep gulches which have passed beyond all possibility of control. Once the soft material underlying the clay, usually at depths of 5 to 10 feet, is reached by the gullies the erosion becomes much more active and destructive. While practically all of the type is suitable for cultivation, very little of it is so level that it should not be terraced or worked in contour rows. Any of the steeper slopes intended for cultivation should be carefully terraced, otherwise erosion will prove very destructive.

The type is of residual origin, resulting from the decay and disintegration of coarse-grained granites. The large areas in the western part of the county are perhaps the most typical. These are derived from a gray, coarse-grained granite of porphyritic structure from numerous large crystals of feldspar. The resistance of these crystals to weathering accounts for so many of them being found in a state of partial decay through the subsoil, although the other feldspathic material of the parent rock has undergone complete decay. The areas north of Chester and through the eastern part of the county are derived from a coarse-grained granite in which the porphyritic structure is lacking. Here, also, the feldspar crystals are absent from the subsoil. However, in these areas there is a greater quantity of quartz fragments strewn over the surface.

Being easy to handle and fairly productive, the type found favor even among the early settlers, and most of it has been under cultivation for a long time. Here and there are small forested areas which give some idea of the original timber growth. These support a heavy mixed growth of oak, hickory, dogwood, shortleaf pine, etc. Areas thrown out of cultivation grow up to wild plum and old-field pine.

Cotton and corn are the only crops grown to any extent. The yields are light to fair, depending upon the quantity of fertilizer used and the way the soil is handled. With the average farmer cotton yields less than a half bale and corn less than 20 bushels an acre. A bale of cotton and from 25 to 50 bushels of corn are produced by some of the best farmers at scarcely any greater expense. The soil needs to be plowed slightly deeper every year until a loamy soil 8 or 10 inches deep is formed. Cowpeas and other legumes should be grown as often as possible in some well-planned rotation, so as to keep the soil well supplied with humus, and slopes should be terraced carefully to guard against erosion. No soil can be kept in a produc-

tive state when a large portion of the rainfall is allowed to work havoc as surface run-off.

Aside from cotton, corn, sorghum, cowpeas, and the few other crops grown, the type is adapted to peaches and other fruits, vegetables, and berries, and would probably grow good tobacco. When worked up deep, with a larger percentage of clay and well supplied with humus, the type should grow good crops of oats, grasses, and forage. For pasture Bermuda grass would give good results.

As with the Cecil sandy loam, probably very little potash is needed in the fertilizer used on this soil. Nitrogen should be supplied largely by growing the legumes.

CECIL FINE SANDY LOAM.

The soil of the Cecil fine sandy loam, to a depth of 4 to 8 inches, is a light brownish gray to light-brown fine sandy loam, resting upon a red, brittle, compact clay extending to a depth of several feet. The subsoil is intersected by frequent thin quartz veins and the breaking down of these wherever exposed has resulted in a scattering of fragments over the surface and mingled with the soil. Under cultivation the humus content has become depleted, resulting in a rather close and compact structure.

The different phases of the type have been brought about largely by erosion. From the shallowest brown to the lighter colored areas where the sandy material is deepest may all be found in comparatively small areas, giving fields a spotted appearance. On the other hand where the surface features are nearly level considerable bodies of the type are fairly uniform.

The Cecil fine sandy loam occurs most extensively in the southern part of the county, extending in a broad belt along the Fairfield County line west of Blackstock. It occupies gently rolling country free from abrupt features and with good natural drainage. While no areas are too steep for cultivation, all of the slopes should be carefully terraced and the rows made to follow the contours to check erosion. Otherwise, a large part of the fertilizers is lost and the soil kept in a productive state with difficulty.

The Cecil fine sandy loam is a residual soil derived from fine-grained, massive to schistose gneiss and mica schist. In places solid rock occurs near the surface, but more generally the clay extends to a depth of 10 to 30 feet and is underlain by a soft, porous material extending to much greater depths. Fine mica flakes are found all through the subsoil clay and to a more limited extent in the soil, though not sufficiently numerous to impart the greasy feel characteristic of the Louisa soils.

A very large proportion of the type is under cultivation and has been for a long time. Some conception of the original forest growth can be had from areas that have never been cleared. These support a heavy growth of oak and hickory, with scattering shortleaf pine, dogwood, and other trees. The white and red oaks especially grow to very large size.

Cotton and corn are the only crops grown on an extensive scale. Small patches are planted to oats and nearly all farmers grow some sorghum, sweet potatoes, and several other crops for home consumption. Cotton yields from one-third to three-fourths of a bale and corn from 10 to 25 bushels per acre. Oats yield from 15 to 50 bushels per acre, depending upon the condition of the soil and the effects of erosion. With better methods, such as would form a loamy soil from 8 to 10 inches deep, all of the crops now grown would give much heavier yields and other crops not now grown could be produced profitably. A variety of fruits should do well.

CECIL CLAY LOAM.

The surface 2 to 5 inches of the Cecil clay loam consists of a reddish-brown loam to clay loam, or in places of a brown, heavy sandy loam. Below this is a heavy, somewhat crumbly or brittle clay, which extends to a depth of several feet. The color and texture of the clay is usually uniform to a depth of 4 or 5 feet, but at greater depths it may show considerable variation in color from red to light brown and red variegated with gray. The texture generally grows lighter with depth, until soft weathered rock is reached. Being largely the result of erosion through sandy types, most of the type presents a spotted appearance. Frequent small areas still have a light surface mantle of sandy loam, while in others all of the virginal soil has been removed, leaving the red clay exposed. In places, however, the soil is a true clay loam, fairly uniform in color and texture over considerable areas. Varying quantities of quartz fragments are strewn over the surface and mingled with the soil and thin veins of quartz are of frequent occurrence through the subsoil clay.

"Red land" and "red clay land" are the names commonly applied to the type. It is more difficult to handle than the Cecil sandy loam and other associated sandy types, and mainly for that reason it is not considered as desirable for farming. The soil is too shallow to retain much of the rainfall, and evaporation from the surface is rapid. As a result most crops suffer quicker for water than they do on the sandier types. Yet, if broken deeply, even though deficient in humus, the soil not only etains moisture well but in sufficient quantities to tide crops over a prolonged drought without much injury. With

proper management it is a strong soil and can be maintained in a high state of cultivation.

The Cecil clay loam is the second most important soil in the Piedmont Plateau region. It is found in every Piedmont county in South Carolina, although much more extensively in some than in others. It occurs in all sections of Chester County, but the most important areas are found south of Chester and in the eastern and western parts, where they are associated with the sandy loam members of the series.

The topography is rolling to hilly and broken. In many places the type is confined to the steeper slopes, while the crests of the ridges are sandy. Again it is found occupying the entire ridge or perhaps some of the more prominent knolls and areas about the heads of streams where erosion is most active. The roughest areas occur along the Broad and Catawba Rivers and some of the larger creeks. Drainage is well established and erosion is active throughout the type, being very destructive in places.

The type is largely the result of erosion over what were originally sandy loam areas, and wherever this is true the soil is similar in texture to the subsoil of the associated sandy type. The areas through the Cecil sandy loam are characterized by a higher percentage of medium and coarse sand than those associated with the Cecil fine sandy loam, and therefore those from the porphyritic granites giving rise to the Cecil coarse sandy loam have a still greater proportion of coarse sand through the clay. The areas associated with the Iredell types, on the other hand, are from dark basic rocks, such as syenite, which weathers only into a heavy soil.

The original forest growth consisted mainly of oak and hickory, which attained large size; but pitch pine has taken possession of most of the cut-over areas and abandoned fields. Pitch pine is now the characteristic growth of the type.

The Cecil clay loam represents in a large measure lands that were cleared years ago and subsequently abandoned on account of erosion and the consequent deterioration in productiveness. Most of the small areas through the sandy types are farmed and patches through the larger areas are cultivated. Cotton and corn are the only crops grown to any considerable extent, the former yielding one-half bale or less and the corn from 10 to 25 bushels per acre. The low yields are due to careless methods rather than to any unproductiveness of the soil. If properly handled the type should be as productive as any other soil in the county, giving good yields of cotton, corn, oats, sorghum, wheat, and grasses. The roughest areas are not suitable for cultivation and should be utilized for forest and pasture lands. Any areas to be used for cultivated crops should be carefully terraced to

check erosion, otherwise the destruction will continue until practically all of the type becomes worthless for agriculture.

CECIL LOAM.

The soil of the Cecil loam is a brownish-gray to grayish-brown or pale-yellow silty loam or heavy fine sandy loam from 4 to 6 inches deep. The low humus content makes the soil light colored and apt to clod and bake unless cultivated under proper moisture conditions. Small quartz fragments, usually brown or pinkish, impart a slight grittiness to the soil, and large fragments are scattered over the surface of some areas. Large granite bowlders appear above ground in local areas, but this is not an important feature of the type. The subsoil is a reddish-brown to red, compact but somewhat friable clay extending to a depth of 3 to 10 feet and grading rapidly below into bedrock. A peculiarity of the clay is that scattered through it are found small crystals of white feldspar in a partial state of decay. In places the subsoil tends to a yellow or yellowish-brown color, the same as characterizes the Durham coarse sandy loam. Such areas usually occur along the lower slopes and about the heads of streams where there must be some seepage, although barely appreciable.

The Cecil loam is an important type in some sections of the Piedmont Plateau region, but it is of very limited extent in Chester County and does not occur at all in some other Piedmont counties of the State. The largest areas lie beyond the Iredell clay loam belt north of Chester. A few small areas were also mapped in the eastern part of the county.

The surface features are nearly level to gently rolling and practically all of the type has good natural drainage. Some damage is being done in all of the fields by surface wash. The soil being so shallow, and overlying, as it does, a close-structured clay which allows only a slow percolation of water, most of the rainfall, especially during the summer months, escapes as surface run-off. As a result the soil is not only being further shallowed and gullied, but crops suffer for water soon after rains.

The type is a residual soil, derived from granites with a higher percentage of feldspar than those giving rise to the sandier members of the Cecil series. At least a part of the parent rock has a pinkish color. The areas north of Chester, which are more nearly typical, are from a pink-colored, medium-grained granite.

The original forest growth consists of post, red, and white oak, hickory, sweet gum, and shortleaf pine. Cut-over areas support a mixed growth, mostly of oak, sweet gum, and shortleaf pine.

Most of the type is under cultivation, being used almost entirely for cotton and corn. The average yield of cotton is less than one-

half bale, while corn ranges from 10 to 15 bushels to the acre. As with most of the other types, small applications of commercial fertilizers are depended upon to produce the crops, and no other attempt is made to keep the soil in a productive state. With a loamy soil from 8 to 10 inches deep formed by deep plowing, applying rough manures, growing legumes as often as possible, the type should grow heavy crops of cotton, corn, sorghum, oats, and no doubt would grow good crops of wheat and grasses for hay. Apples, peaches, pears, and other fruits do well.

DURHAM COARSE SANDY LOAM.

The soil of the Durham coarse sandy loam, to a depth of 6 to 10 inches, is a gray to pale-yellowish coarse sandy loam. In cultivated areas the soil is of a light-gray color to plow depth and yellowish beneath, while in the forested areas only the surface inch or so is gray, the underlying material being yellow. Its coarseness is due to a large quantity of angular quartz gravel, generally smaller than a pea in size. There is scarcely any stone on the surface or in the soil, except in local areas, which may be strewn with quartz fragments and have large fragments of granite appearing above the surface. The subsoil is a yellowish to brownish-yellow sandy clay or brown, compact clay, carrying a large quantity of angular quartz gravel. In places it has a tinge of red extending from immediately below the soil to a depth of several feet, but more generally it is yellow or brownish yellow, with little variation to a depth of 2 or 3 feet, below which it may grade directly into partially weathered rock or extend to greater depths and show some mottlings of red and gray.

The type occurs in two phases, which are about the same in appearance but differ considerably in texture. The coarse phase, represented by areas north of Chester and near Lewis Station, is almost a fine gravelly loam. The soil material consists very largely of fine, angular gravel, ranging up to the size of a pea. The other areas are more nearly typical, being somewhat more loamy.

The Durham coarse sandy loam is not an extensive type. The most important areas mapped are those north of Chester and near Lewis Station and a strip extending along the crest of the ridge between Dinber and Lowryville. Smaller areas, many of which are too small to be shown on the soil map, occur through the larger bodies of the Cecil coarse sandy loam in the northern part of the county.

The surface features are nearly level to gently rolling, and the natural drainage is fairly good. Local areas, affected by a small amount of seepage, would be improved by drains.

The type is of residual origin, formed by the decay of coarse-grained and porphyritic granites, the same, apparently, as those giving rise to the Cecil coarse sandy loam. The areas at Lowryville and others associated with the Cecil coarse sandy loam south and west of Lowryville are from a light-gray granite, through which are numerous large crystals of feldspar. The areas north of Chester are derived from a gray, coarse-grained granite, carrying a very high percentage of quartz.

The native forest growth consists of oak, hickory, pine, dogwood, etc., pine being more plentiful than on the sandy Cecil soils.

A very large proportion of the Durham coarse sandy loam is under cultivation. It is naturally less productive than any of the Cecil soils, but it is easy to handle, and by careful treatment can be made to produce good crops of corn, cotton, sorghum, sweet potatoes, tobacco, rye, vetch, and a variety of other crops. It should prove especially adapted to peaches and grapes. As now handled it gives light yields of corn and cotton, the only crops grown to any extent. Cotton averages less than one-half bale and corn less than 20 bushels to the acre.

The soil being so open of structure and so highly siliceous, it does not have the capacity for holding humus for any great length of time. This, with the prevailing careless methods of cultivation, has resulted in reducing the humus content to a minimum. To make the soil productive it is necessary to greatly increase its humus content, which can best be done by growing and plowing under legumes, such as vetch, cowpeas, and soy beans, all of which will do well and produce excellent forage. Complete mixtures—those containing phosphorus, nitrogen, and potash seem to give best results on this type.

DURHAM SANDY LOAM.

The soil of the Durham sandy loam, to a depth of 4 to 6 inches, is a light-gray, medium-textured sandy loam, ordinarily deficient in humus. It is underlain by a yellowish sandy loam, becoming heavier with depth and grading into brownish-yellow, friable sandy clay at a depth of 15 to 18 inches. Mottlings of red and gray are noticed at depths below 2½ to 3 feet. Scattering fragments of quartz are strewn over the surface and throughout the 3-foot section.

The Durham sandy loam is not an extensive type in Chester County. The largest area mapped extends from Lando over into York County. Several smaller areas occur through the eastern and western portions of the county, generally in association with the sandy loam and coarse sandy loam members of the Cecil series.

The topography ranges from nearly level to gently rolling, with good natural drainage. Several areas along some of the lower slopes

are more or less subject to seepage waters and would be improved by tile or open ditches.

A light-gray granite is the principal rock from which the type is derived, although some areas are from gneiss, the same as gives rise to the typical Cecil sandy loam.

The type originally supported a good growth of oak, hickory, and pine. Over half of the type is under cultivation. The soil is too light for general farming and as now handled the average yields are unsatisfactory. Cotton yields from one-fourth to three-fourths of a bale and corn from 10 to 20 bushels per acre. The best farmers, however, get one-half to 1 bale of cotton and 25 to 40 bushels of corn. The type is especially adapted to trucking, such as early vegetables, sweet and Irish potatoes, and tomatoes, and to the growing of berries, grapes, peaches, and tobacco, but none of these are grown for the market. Rye gives good yields and should prove a profitable crop for both grazing purposes and for the grain. The most essential requisite is to keep the soil well supplied with humus, which can be done by growing and plowing under green manuring crops and by a carefully arranged rotation, which should include one or more legumes.

DURHAM LOAM.

The soil of the Durham loam, to a depth of 4 to 7 inches, is a light brownish gray or pale-yellowish silty loam somewhat compact and deficient in humus. In the low-lying, flat areas the soil is a light gray, while in those of better drainage it is brownish gray where under cultivation and yellowish except in the surface inch or so, which is gray over forested areas. In the fields it has a light-gray color, with only a slight brownish cast, and appears quite unproductive. A slight grittiness is imparted to the soil by small quantities of coarse quartz sand, fine grit, and occasional small stones. The subsoil is a brittle to plastic yellowish-brown clay, through which is usually found small white crystals of partially decomposed feldspar. There is some mottling of the subsoil in certain areas, while in others of poor drainage it varies from light gray to brownish. Bedrock in a soft, weathered condition is found, as a rule, within 4 to 6 feet of the surface. A few patches which closely approach the character of the Worsham series are included with this type; also some spots of Cecil loam too small to separate.

The Durham loam is the least extensive type in the county. Several small areas, aggregating slightly over a square mile in extent, occur to the north of Chester along the York road. Only two other areas were mapped, both of which are small, one at Rossville and the other about 2½ miles northeast of Well Ridge Church.

The topography is flat to very gently rolling. Areas with enough relief for the surface waters to run off are fairly well drained, but

the flat areas lack adequate drainage and should be tiled before any attempt is made at agriculture.

The Durham loam is derived from granites with a high content of feldspar and not much mica. The areas north of Chester, which are typical, are derived from a pink granite, the same as gives rise to adjoining areas of the Cecil loam, the difference between the two being due more to drainage than to any inherent differences in the parent rock.

About half of the type is in cultivation. The other half has a scattering forest growth of blackjack and post oak, small shortleaf pine, cedar, sweet gum, and black gum. Light yields of cotton and corn are secured. It probably would give more satisfactory returns if devoted to pasturage and to forage crops. It can be made to grow heavy crops of cowpeas, sorghum, and millet. Both Bermuda grass and Japan clover thrive, giving excellent pasturage.

The soil is in need of vegetable matter. Commercial fertilizers or barnyard manure are necessary for good yields.

IREDELL CLAY LOAM.

The soil of the Iredell clay loam to an average depth of 4 inches is a dark-brown, fine loam to clay loam noticeably sandy in places. Quartz fragments are scattered over the surface of most areas and small iron concretions are found throughout the soil mass. The soil grades rapidly with depth into a heavy, sticky, plastic waxy clay, usually a dark or dingy yellowish brown in color, but varying to different shades of dark brown and greenish drab or greenish yellow. The tough, plastic properties of the clay become more pronounced with depth, until at 2½ to 3 feet a mass of soft, decaying rock is encountered. In places solid bedrock occurs from 3 to 5 feet from the surface, but more generally the soft material, interrupted by large fragments or ledges of solid rock, extends to a depth of 10 feet or more. Just below the clay the soft decayed rock is brown or brownish gray in color, becoming lighter with depth. Some of the very flat areas, as occur in and near the city limits of Chester and surrounding lands, are rendered somewhat stony by large fragments of the parent rock, occurring either entirely above ground or partially buried. The behavior of the soil under cultivation depends upon whether much, if any, of the underlying clay is plowed up from year to year. Where free from clay the soil is mellow and friable and does not clod badly unless cultivated when too wet. With some of the raw clay mixed with it the structure is more intractable and greater care is necessary in order to keep it from baking and clodding badly. It is naturally a productive soil.

The type is commonly known as "blackjack land" or "limestone land." It is not a limestone soil by any means, as it is derived from

diorite and other closely allied dark basic rocks of igneous origin, although similar in several respects to some limestone soils. The dark-brown, mellow soil and its ability to hold a fair supply of humus even under the prevailing careless methods of handling it and the dark color and sticky properties of the subsoil are closely approached in certain limestone soils. Also the soil is neutral or alkaline in reaction. Possibly, however, the name "limestone" soil suggested itself from the fact that the well and stream water throughout the type are strongly impregnated with lime.

The Iredell clay loam is one of the important soils in the county. It forms an almost continuous wide strip through the center of the county, extending from north of Lewis Station in a southwesterly direction past Chester. Other important areas are found skirting Little Sandy River and Turkey and Susybole Creeks. Wherever found it lies at a lower elevation than the adjoining types of the Cecil, Appling, or Durham series. For instance, the large areas around Chester are bordered by a prominent ridge or an abrupt rise into the other types which occupy the ridges. In places it is interrupted by bold, narrow ridges occupied by either the Cecil clay loam or Cecil sandy loam or in some instances by the Appling sandy loam.

The surface features range from nearly level to gently rolling. The flat areas as a rule are the least desirable, as drainage is usually poorly established and bedrock close to the surface. There is not enough relief for the water to find its way off, except very slowly at the surface, and the heavy clay prevents any effectual underdrainage. The surplus water evaporating from the surface makes the soil close, clammy, and cold. The rolling areas, on the other hand, have fairly good drainage.

The original forest growth of the more level areas consisted mainly of blackjack and scrubby post oaks, cedar, water, and willow oaks, shortleaf pine, and a few other varieties of trees. The better drained areas supported a medium to heavy mixed growth of oak, hickory, pine, cedar, and other hardwoods.

A very large proportion of the type is under cultivation. It is used most extensively for cotton and corn, although oats, sorghum, cowpeas, and pasturage are also grown with good results. Cotton has a tendency to go too much to weed, and does not fruit so well as on the sandy types. If heavily manured it grows late in the fall. The yields of this crop vary quite widely, the average being near one-half bale per acre. The type is a good corn soil if handled properly, though the average yield is less than 20 bushels per acre. It should prove especially adapted to clover and grasses and some areas no doubt would grow good alfalfa. The best uses of the type are for corn, wheat, oats, and forage crops, and for stock raising and dairy-

ing. Melilotus, Johnson grass, red clover, and Japan clover, or lespedeza, are found growing luxuriantly along the roadsides. While Johnson grass is considered a pest it gives enormous yields of good hay wherever it is given a chance. Bermuda grass thrives and gives the best of pasturage.

Cotton shows a tendency to "rust" and corn to "french" on this type. The most effective remedy in dealing with these problems is the application of potash salts.

IREDELL COARSE SANDY LOAM.

The soil of the Iredell coarse sandy loam consists of a brownish-gray, coarse sandy loam from 6 to 8 inches deep. At the surface it is gray or light gray, except in freshly eroded spots, which are brownish. The coarseness of the soil is due to numerous quartz grains, usually less than an eighth of an inch in diameter. Some areas are almost devoid of stone, while others are strewn with angular quartz fragments. The subsoil typically is a dingy yellowish brown or brown, tough, plastic clay, of smooth feel, except for occasional angular quartz grains, as found in the soil. The subsoil may be very tough and plastic just below the soil, becoming somewhat lighter in texture and color with depth, grading into a drab or bluish gray tinged with brown. Coarse, gritty loam to clay loam may also be encountered to a depth of 12 to 15 inches. Below this is a dingy brown, tough clay which grades into partially decayed rock at a depth of 2 to 8 feet.

The type is of limited extent and associated with the Iredell clay loam. One of the most important areas mapped is found near Chester, forming a narrow strip about 4½ miles long. Several other areas occur in the central part of the county near Orrs.

The topography is gently rolling to rolling and hilly. Most of the strip south of Chester is rolling to hilly and the steeper hillsides are subject to severe erosion, being badly washed and gullied in places. Were it not for the preponderance of coarse sand forming the soil, which is not so easily moved by flowing waters, the damage from erosion would be much more severe than it is. The areas near Orrs occur for the most part on low ridges or knolls rising 5 to 10 feet higher than the surrounding Iredell clay loam. These are not subject to much erosion and furnish sufficient relief to provide good surface drainage. Underdrainage, as with the other Iredell types, is slow, on account of the heavy, close-structured subsoil.

The Iredell coarse sandy loam is derived from a gray, granitelike rock, which in a soft, weathered state is still found within 2 to 3 feet of the surface.

The original forest growth consisted of oak, with a scattering of hickory and other hardwood trees and some shortleaf pine. Some of the washed areas thrown out of cultivation are growing up in scrub pine, oak, cedar, plum, etc.

A large proportion of the type is under cultivation. The average yield of cotton is less than one-half bale and of corn less than 20 bushels per acre. Sorghum, sweet potatoes, and oats are grown for home use. With better methods of cultivation and careful attention to the rotation of crops the Iredell coarse sandy loam should give fair yields of all the crops now grown upon it. The roughest areas, which are being ruined by erosion, should be seeded to Bermuda grass and used for pasture lands.

IREDELL SANDY LOAM.

The Iredell sandy loam, to a depth of 6 to 10 inches, is a brownish-gray to light-brown, medium-textured sandy loam, with a fairly large content of quartz fragments. The subsoil varies from a yellowish-brown, plastic clay loam, grading into soft, weathered rock at a depth of 15 to 24 inches, to a heavy, plastic clay like the subsoil of the Iredell clay loam. The typical areas have a sandy loam soil about 6 inches deep. This grades through a brown loam into a stiff plastic clay at a depth of 12 to 18 inches and the clay into soft, weathered rock at a depth of 24 to 30 inches. Generally the clay is stickiest and most plastic just above the decaying rock, and has a dingy-brown color. The color is as variable as the texture. In places it is yellowish brown, in others a dingy brown, and again it may be a greenish drab or gray and brown mottled. These are local variations which as a rule follow differences in the parent rock.

The type occurs in a number of scattered areas. Some were mapped near Turkey Creek and several through the southern and eastern portions of the county. The largest occurs near Great Falls, extending from Fishing Creek to Rocky Creek.

The topography is generally rolling, with small, nearly level areas. There is sufficient relief at all times to afford fairly good natural drainage.

The Iredell sandy loam is a residual soil derived from the more siliceous phases of a rock resembling syenite and similar basic rocks. In places, no doubt, it is influenced by material from granite and gneiss. A number of the smaller areas are nothing more than a gradation type between the Iredell clay on the one hand and the Cecil sandy loam or Durham sandy loam on the other hand. Some of the larger areas, however, which are the more nearly typical, owe their characteristic properties to differences in the parent rock.

The type originally supported a medium to heavy mixed growth of oak, hickory, and other hardwood trees and shortleaf pine. It is

now nearly all under cultivation, being used principally for cotton and corn, which give light to fair yields. The prevailing low yields are due more to the careless methods of cultivation than to any natural unproductiveness of the soil. Where the tenants usually get from one-fourth to one-half bale of cotton and 10 to 15 bushels of corn per acre, the better farmers produce one-half to three-fourths of a bale of cotton and 25 to 40 bushels of corn. The best use of the type is for general farming, but more attention should be given to stock raising and the rotation of crops. In all areas the soil is deficient in humus, a fact which partly accounts for the low average yields.

APPLING SANDY LOAM.

The surface soil of the Appling sandy loam consists of a brownish-gray to light or yellowish brown, medium-textured sandy loam from 6 to 8 inches deep. The typical subsoil is a reddish-brown, compact clay, 2 feet or more in depth, below which streaks of blue, red, and gray occur, the soft, weathered rock being encountered at 2½ to 5 feet. This material is somewhat coherent, but crumbles easily and is readily penetrated by tree roots.

Erosion is active over most of the type. Where little or no erosion is going on the soil is a light brownish gray, the surface few inches being gray. Areas subject to surface wash vary in color from yellow to light brown. The light color and close structure of the soil indicate a lack of humus, a better supply of which would give it a dark-gray to brown color and greatly increase its capacity for absorbing and holding moisture.

The Appling sandy loam is a residual soil formed by the weathering of a light-colored granite or closely allied rock. It occurs most extensively in the central and southern portions of the county. Large areas were mapped along the Fairfield County line extending east from the Sandy River. Several areas occur southwest of Chester, and others near Great Falls and in the northwestern corner of the county along Turkey Creek.

From its position, color, and structural properties the type may be considered as intermediate between the Durham and Iredell sandy loams and the Cecil sandy loam. The subsoil is not red enough and it is too plastic for the Cecil and it is much too friable and has too much of a reddish cast for the Iredell, while there is too much mottling for the Durham. The comparatively shallow depth to partially decomposed rock, however, shows a tendency toward the Iredell.

The topography is generally rolling and natural drainage well established, though the type is subject to severe erosion in places. The deep, soft material underlying the clay affords the best underdrainage. This material also accelerates erosion once it is reached by the gullies.

A large proportion of the type is under cultivation. Small areas here and there are still forested with a mixed growth of oak, hickory, pine, dogwood, and other hardwoods, as found on the Cecil sandy loam. Average yields of cotton and corn, which are the only crops grown to any extent, are light, yet with good management the type can be made to produce as much as a bale of cotton and from 25 to 50 bushels of corn to the acre. Its susceptibility to erosion and the difficulty of checking this form of soil loss in cultivated fields makes the type better adapted to stock raising than to general farming. It should be used principally for forage crops and as pasture.

MECKLENBURG CLAY LOAM.

The surface 3 to 5 inches of the Mecklenburg clay loam consists of a reddish-brown fine loam to clay loam, resting upon a reddish-brown to red, plastic clay. At a depth of 12 to 18 inches the red clay grades into a dingy yellowish brown or gray and brown, mottled, tough plastic clay, like the subsoil of the Iredell clay loam, and this in turn grades into partially decayed rock at a depth of 3 to 10 feet or more. Except for scattering fragments of quartz on the surface, the soil is practically free of stone. It is deficient in humus, owing to careless methods of cultivation and on account of its shallow depth, which allows some of the raw subsoil clay to be plowed up every year; it clods and bakes rather badly. However, it is not unduly droughty and is considered naturally productive. Plowed fields at first sight appear quite red, but at close range are distinctly brownish in color.

The type is of limited extent, being found mostly in small areas through the Iredell clay loam and occupying knolls, ridges, and the better drained slopes. Most of the areas mapped occur southwest of Chester.

The Mecklenburg clay loam is a residual soil formed from the decay of dark-gray, massive rocks, high in content of dark-colored mineral resembling hornblende. Most of the areas are probably from syenite, but some bear evidence of being from a variety of granite, as there is an abundance of fine mica in the deep subsoil. The color and structural properties of the soil and subsoil are intermediate between those of the Iredell clay loam and the Cecil clay loam.

The original forests consisted of a heavy, mixed growth of oak, hickory, and other hardwood trees.

Most of the type is under cultivation, being used principally for cotton and corn. Cotton yields from one-fourth to three-fourths of a bale and corn from 10 to 25 bushels per acre. Yields now secured could be more than doubled by better methods of tillage and cultivation. The land should be broken about an inch deeper every year until a soil is formed from 8 to 10 inches deep, and leguminous crops,

such as cowpeas, clover, vetch, etc., should be grown as often as possible in a well-planned rotation. Subsoiling, too, would prove very beneficial. In a high state of cultivation the type should grow heavy crops of corn, wheat, grasses, clover, sorghum, etc. It could also probably be used for alfalfa, although somewhat too heavy for the best results with this crop. Its best uses are in the line of small grains, forage crops, and stock raising. Indicative of its natural productiveness is the rank growth of clover, melilotus, and Johnson grass found along the roadsides.

WORSHAM SANDY LOAM.

The surface soil of the Worsham sandy loam consists of a light-gray, medium-textured sandy loam from 4 to 6 inches deep. In places it has a smooth texture, but more generally there is enough angular, coarse quartz sand and fine gravel present to give it a gritty feel. Even in the forested areas the soil is deficient in humus, and in the cultivated areas there is less still, the surface of the fields appearing light gray to white. The subsoil to a depth of 15 to 18 inches is a coarse, gritty, sandy loam varying in color from light gray to gray, streaked with yellow and yellowish brown. Below this is a mixture of clay and partially decomposed rock, which has a slight degree of plasticity. The content of clay decreases downward, and below a depth of 8 feet the material is little else than the rock in a partially decomposed and crumbled state.

This type is confined to two areas in the southern part of the county, one a strip from one-fourth of a mile to a mile wide south of Little Sandy River, extending in a southwesterly direction to near the Fairfield County line, and the other near the southwestern corner of the county, extending east and west from the Sandy River to the Broad River.

The topography is gently rolling to hilly, some of the steeper slopes being badly eroded. The type is naturally well drained, except some narrow strips along the lower slopes, which are affected to some extent by seepage.

The Worsham sandy loam is a residual soil, derived from a light-gray, massive granitelike rock carrying a high percentage of quartz and only a very small percentage of mica. At one extreme the type blends into the Iredell sandy loam and at the other into a soil very similar to the Durham sandy loam. So in a way it may be considered as intermediate between these two types.

The character of the forest growth indicates a soil naturally less productive than any of the Cecil types or of the Durham, except the loam. Post and blackjack oaks, with scattering hickory and shortleaf pine, constitute the principal growth.

Over half of the type is under cultivation. The average yield of cotton is less than one-half of a bale and of corn less than 20 bushels per acre. It is too light in its natural condition for general farming, but if handled properly can be made to produce medium to good crops of cotton, corn, oats, sorghum, sweet potatoes, cowpeas, and rye. The roughest areas should be seeded to Bermuda grass and turned into pasture land or be allowed to reforest themselves. The soil is badly in need of vegetable matter, which can be supplied by plowing under cowpeas or rye. Commercial fertilizers or barnyard manure also should be used.

MEADOW.

All of the bottom or alluvial lands of the county are grouped under the term Meadow. Narrow bottoms occur along the rivers and all of the creeks and smaller streams have overflow strips varying from a rod or so to nearly one-half mile in width, many being too narrow to show on the soil map. The river bottom soils originally were fairly uniform, consisting as a rule of a sand or fine sand in a narrow strip along the banks and of a brownish silty loam or fine sandy loam back next to the slopes. The disastrous floods of recent years have strewn sand over the once fertile fields, and now there are local variations from loose sand to loam and silt loam. Originally the sandiest areas skirt the stream and back of this the soil is more loamy, if not in the immediate soil in the buried soil now forming the subsoil. The creek bottoms are more variable still. The original soil was for the most part a dark-brown to black sandy loam to loam, but the floods of recent years have covered most of this with loose sand, so that now there is an alternation of loose sandy and loamy spots in very limited areas. Generally the narrowest bottoms are the sandiest and most subject to changes with every overflow.

The bottom lands were highly prized by the early settlers for the production of corn and forage crops. Then overflows were not so frequent and rarely destroyed the crops, but as more and more of the uplands were cleared and put under cultivation, floods became correspondingly more frequent and disastrous, until now there is so much risk of losing the crops that nearly all of the bottom lands have been thrown out of cultivation. The creek bottoms in most places are badly waterlogged as the result of the streams being so badly choked with sand washed in from the hills. The river bottoms are not so wet, but crops on them are uncertain, on account of the overflows. Small areas are still used for the production of corn, and when the seasons are favorable the yields are heavy. The areas thrown out of cultivation are growing up in birch, willow, alder, and coarse water-loving grasses.

While these lands have been growing less desirable every year and are not now farmed to any extent, they are not beyond the possibility of reclamation, at least to the extent of converting them into good pasture. With the proper terracing of the hillsides, which is necessary to preserve them from destruction, the volume and damage of the floods would be greatly lessened. Checking erosion on the hillsides would also greatly lessen the deposits of sand in the bottoms. Ditches should also be cut along the slopes to take care of the seepage, and the streams should be kept clear of trash, underbrush, and other obstructions.

SUMMARY.

Chester County, with an area of 592 square miles, or 378,880 acres, lies in the north-central part of the State well up in the Piedmont Plateau region, the general elevation being from about 400 to 700 feet above sea level. Streams are numerous and nearly all of the lands are rolling and naturally well drained. Some areas are rough and undesirable, but most of the lands are well situated for farming.

Drainage is about equally divided between the Catawba and Broad Rivers, which form the eastern and western boundaries, respectively. The largest streams in the county are Rocky, Fishing, and Turkey Creeks and Sandy River.

The county has an extensive system of public roads and good railroad facilities. All sections are reached by the Rural Free Delivery Service.

The population of the county in 1910 was 29,425. Nearly all of the white people are native born and direct descendants of the early settlers—mostly English, Scotch, and Scotch-Irish. Chester, the county seat, with a population of 4,754, is the largest city and chief market center.

The interests of the county are very largely agricultural, although the manufacturing interests are represented by numerous cotton factories, seed mills, and other industrial and hydraulic plants. Large electric plants are in operation on the Catawba and Broad Rivers, supplying light and power to the cities as far north as Charlotte, N. C., and as far west as Greenville.

The climate is mild, pleasant, and healthful, with short, open winters and a long, growing season. The average rainfall of 48 inches is well distributed throughout the year.

Cotton is the most extensive crop and the chief source of revenue. Next in importance is corn, and oats rank third. Wheat, cowpeas, sorghum, and many other crops are grown on a very limited scale. The system of farming is not greatly different in any section of the county or upon any particular kind of land. The question of the adaptation of certain soils to certain crops or of the necessity for

rotating crops to keep the soil in a productive state has not received much attention. Commercial fertilizers are depended upon almost entirely for the purpose of maintaining crop yields instead of relying upon crop rotation, stock raising, and crop diversification. A large proportion of the lands are now handled by negro tenants. There is an abundance of labor, but most of it is absorbed in the tenant system.

Land values are still very reasonable, the average for the county being between $15 and $25 an acre.

The county has a variety of soils varying from coarse sandy loam to heavy clay. Fourteen types were recognized and mapped in the uplands, all being of residual origin from the underlying rocks. Based upon differences in origin, color, and structural properties they are divided into six series—Cecil, Durham, Iredell, Mecklenburg, Appling, and Worsham. Five types belong in the Cecil series, three in the Durham, three in the Iredell, and one each in the Appling, Mecklenburg, and Worsham. The Cecil sandy loam, Cecil coarse sandy loam, Cecil clay loam, and Iredell clay loam are the main types, the others being limited in extent. The bottom lands are very limited in extent and on account of their wet nature are classed as Meadow.

The Cecil sandy loam is a very desirable soil, easy to till and to keep in a productive state. It is used principally for cotton and corn, to which it is well adapted. It will grow good crops of oats and any other of the general crops of the region. It is good soil for dairy farming and the raising of hogs, beef cattle, and horses and mules. It is also adapted to tobacco, peaches and other fruits.

The Cecil coarse sandy loam is not considered as productive as the Cecil sandy loam, but it yields fair to good crops of cotton and corn and is equally adapted to a variety of other crops not now grown. It should prove especially well adapted to peaches. All of the cultivated areas should be kept better supplied with humus.

The Cecil fine sandy loam is an easy soil to handle and can be brought to a high state of cultivation. It is now used principally for cotton and corn. It is a good soil for general farming.

The Cecil clay loam is the heaviest soil of the Cecil series and represents in a large measure areas that have been denuded of the original soil covering. It is naturally a very stony soil and the best areas are highly prized for corn, cotton, and oats. Much of it, however, is badly gullied and going to ruin. Such areas should be seeded to Bermuda grass and turned into pasture lands. All areas under cultivation should be carefully terraced to check erosion.

The Cecil loam is a very inextensive type, growing light yields of cotton and corn. If plowed deeper and subsoiled it could be made very productive.

The Durham coarse sandy loam and sandy loam are light sandy types, especially adapted to peaches, grapes, watermelons, cantaloupes, sweet potatoes, and a variety of vegetables. They are now used almost entirely for cotton and corn, which give light to fair yields. All areas are very deficient in humus.

The Durham loam is an inextensive type, little of which is farmed. Small areas under cultivation give light yields of cotton and corn. It probably could be used to best advantage for pasturage and forage crops. The flatter areas need artificial drainage.

The Iredell clay loam is an important type, both in extent and agriculturally, most of it being under cultivation. It is naturally productive and with good treatment will give excellent yields of cotton, corn, and oats. Its best uses are for grains, forage crops, and pasture lands. Clover thrives wherever it has a chance to grow, and probably some of the best drained areas would grow good alfalfa.

The Iredell coarse sandy loam and the Iredell sandy loam are very limited types farmed principally to cotton and corn. The yields are light, but if better methods were practiced any of the crops grown should give good yields. Some of the areas most subject to erosion should be used for pasture lands or be allowed to grow up in forest.

The Appling sandy loam, on account of its rolling topography and susceptibility to severe erosion, offers best opportunities in the line of stock raising. It should be used principally for forage crops and pasture lands. Carefully farmed it can be made to grow about as good crops of cotton, corn, cowpeas, etc., as the Cecil sandy loam.

The Mecklenburg clay loam is a minor type, rather difficult to handle but naturally productive. It is best adapted to grains, forage crops, and pasturage.

The Worsham sandy loam is a very light gray sandy soil, deficient in humus. It is too light for general farming, but if properly handled can be made to grow good crops of cotton, corn, sorghum, sweet potatoes, cowpeas, and rye. The roughest areas can be used to best advantage for pasture lands, seeding them to Bermuda grass.

The bottom soils included under the term Meadow are naturally very productive, but crops are very uncertain, on account of frequent overflows. Their best uses are for pasture lands and growing grasses for hay.

NRCS Accessibility Statement

This document is not accessible by screen-reader software. The Natural Resources Conservation Service (NRCS) is committed to making its information accessible to all of its customers and employees. If you are experiencing accessibility issues and need assistance, please contact our Helpdesk by phone at 1-800-457-3642 or by e-mail at ServiceDesk-FTC@ftc.usda.gov. For assistance with publications that include maps, graphs, or similar forms of information, you may also wish to contact our State or local office. You can locate the correct office and phone number at http://offices.sc.egov.usda.gov/locator/app.

The U.S. Department of Agriculture (USDA) prohibits discrimination in all its programs and activities on the basis of race, color, national origin, age, disability, and where applicable, sex, marital status, familial status, parental status, religion, sexual orientation, genetic information, political beliefs, reprisal, or because all or a part of an individual's income is derived from any public assistance program. (Not all prohibited bases apply to all programs.) Persons with disabilities who require alternative means for communication of program information (Braille, large print, audiotape, etc.) should contact USDA's TARGET Center at (202) 720-2600 (voice and TDD). To file a complaint of discrimination write to USDA, Director, Office of Civil Rights, 1400 Independence Avenue, S.W., Washington, D.C. 20250-9410 or call (800) 795-3272 (voice) or (202) 720-6382 (TDD). USDA is an equal opportunity provider and employer.