Issued December 30, 1916.

U. S. DEPARTMENT OF AGRICULTURE,

BUREAU OF SOILS—MILTON WHITNEY, Chief.

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

SOIL SURVEY OF CLAY COUNTY, ALABAMA.

BY

ARTHUR E. TAYLOR, IN CHARGE, AND E. S. VANATTA, OF THE U. S. DEPARTMENT OF AGRICULTURE, AND N. ERIC BELL AND J. L. ANDRESS, OF THE ALABAMA DEPARTMENT OF AGRICULTURE AND INDUSTRIES.

HUGH H. BENNETT, INSPECTOR, SOUTHERN DIVISION.

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

WASHINGTON:
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1916.

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LETTER OF TRANSMITTAL.

U. S. DEPARTMENT OF AGRICULTURE,
BUREAU OF SOILS,
Washington, D. C., June 20, 1916.

SIR: Under the cooperative agreement with the State of Alabama, a soil survey of Clay County was carried to completion during the field season of 1915.

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

Respectfully,

MILTON WHITNEY,
Chief of Bureau.

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

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SOIL SURVEY OF CLAY COUNTY, ALABAMA.

By ARTHUR E. TAYLOR, In Charge, and E. S. VANATTA, of the U. S. Department of Agriculture, and N. ERIC BELL and J. L. ANDRESS, of the Alabama Department of Agriculture and Industries.—Area Inspected by HUGH H. BENNETT.

DESCRIPTION OF THE AREA.

Clay County lies in the east-central part of Alabama. It is bounded on the north by Talladega and Cleburne Counties, on the east by Randolph County, on the south by Tallapoosa and Coosa Counties, and on the west by Talladega County. Its area is 602 square miles, or 385,280 acres.

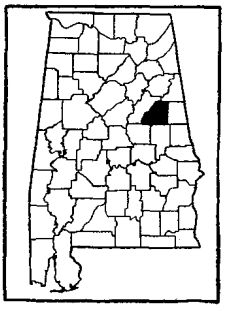

FIG. 1.—Sketch map showing location of the Clay County area, Alabama.

Clay County includes parts of two physiographic provinces, the Appalachian Mountain province, which occupies about one-sixth of the county in the extreme western part, and the Piedmont Plateau province, which comprises the remainder of the area. The country consists of a series of parallel ridges and valleys extending in a general northeasterly and southwesterly direction, with some broad, rolling areas intervening. The largest and highest of the ridges is known as the Talladega Mountains. These mountains are in the western part of the county, and consist of narrow-crested quartzite ridges, rising 500 to 1,100 feet above the surrounding country and 1,500 to 2,100 feet above sea level. The slopes are very rocky and steep. In many places narrow, rocky gorges have worked their way almost back to the crests.

West and northwest of the Talladega Mountains is a much dissected plateau region, characterized by steep slopes and narrow ridges. These rise 100 to 350 feet above the valley floors, and have an average elevation of about 1,000 feet above sea level.

South and east of the Talladega Mountains is a series of long and narrow parallel ridges, forming a belt 4 to 6 miles wide, known as Red Ridge. These ridges extend southwestward from the northeastern corner of Clay County to the vicinity of Millerville, Mount Tebo Church, and Coleta. They rise 200 to 700 feet above the adjoining valleys, and 1,200 to 1,700 feet above sea level. Parts of Red Ridge are very broken, containing many sharp ridges and steep, rocky slopes, but in places this division includes broad ridges and gentle slopes, very well suited to cultivation.

From Manning Chapel northeast to the Cleburne County line the broad Shinbone Valley separates the Talladega Mountains and Red Ridge.

Extending east from Red Ridge to the Randolph County line and south to Spring Hill School, Lystra Church, Big Spring Church, and the Primitive Baptist Church is a gently rolling to rolling plateau, with long, gentle slopes and broad ridges. The surface is well suited to general farming, but is broken here and there by small, much-dissected areas comprising narrow ridges and steep slopes. This plateau has an average elevation above sea level of about 950 feet.

Immediately south of this plateau and extending south to the Tallapoosa County line is a large area consisting of belts of parallel ridges with intervening valley areas where the topography varies from undulating to rolling, with broad ridges and gentle slopes. The ridge belts are characterized by their steep, highly dissected slopes and sharp crests. White Oak Mountain, Mount Ararat, and Hillabee Ridge are included in these belts. The towns of Mellow Valley and Gibsonville are located in important valley areas. Similar topographic conditions prevail westward from Millerville and Pinkneyville to the Talladega Mountains, except that small areas having an undulating surface occur northwest of Millerville, in the vicinity of Hollins, and between Hollins and Brownsville.

Clay County lies within the drainage basins of the Coosa and Tallapoosa Rivers. The principal watershed extends southward from Cleburne County, following the Talladega Mountains to a point three-fourths mile north of Pyriton, where it turns eastward for about a mile, and then continues in a general southwesterly course to a point near the Quenelda graphite mine; thence it follows a general southerly direction, passing into Tallapoosa County just west of Elias. West of this divide the streams flow westerly and southwesterly to the Coosa River; to the east the drainage is eastward and southward to the Tallapoosa River.

Although every part of Clay County is reached by drainage ways, there are no large watercourses. The streams flow rapidly and have cut deep channels. In the Appalachian section of the county the larger streams usually flow either northeast or southwest in conformity with the geological structure and topographic features, but in the Piedmont section they sometimes flow almost at right angles to the strike of the rocks.

The larger valleys of the county lie between parallel ridges, and may be classed as structural, modified by stream erosion. They lie 200 to 1,100 feet below the crests of the ridges, and vary from 1 to 3 miles in width. Where stream erosion has been the prime factor in the development of the valleys they rarely exceed 300 feet in depth

and one-half mile in width. There are no extensive bottom lands in the county, one-half mile being about the maximum width.

Clay County was originally a part of Randolph and Talladega Counties, and was established in 1866. The early settlers were of Anglo-Saxon descent, and came from Georgia, the Carolinas, and Tennessee. The present white population consists mainly of descendants of these early settlers. There are very few foreigners, and only a small percentage of the population consists of negroes. The total population of Clay County is reported in the census of 1910 as 21,006. There are no towns of 2,500 or more inhabitants, and the entire population is therefore classed as rural, with a density of settlement of 34.2 persons to the square mile.

Ashland, in the central part of the county, is the county seat and an important local market. Its population is reported in the 1910 census as 1,062. Lineville, situated on the Atlanta, Birmingham & Atlantic Railroad about 7 miles northeast of Ashland, is an important shipping point, with a population of 1,053. The third largest town is Hollins, with a population of 688.

The railroad transportation facilities in Clay County are inadequate. The Atlanta, Birmingham & Atlantic Railroad traverses the county from east to west and has a branch extending from Pyriton to Ashland. The Central of Georgia Railway crosses the extreme southwest corner of the county.

Public roads extend into all parts of the county, and the more important ones are kept in fair condition. Under the present road-working system all the public roads receive some attention, and many of the steep grades in the mountainous and hilly sections are being abandoned for gentler grades.

CLIMATE.

The climate of Clay County is characterized by long summers and short, mild winters. The mean annual temperature, according to the records of the Weather Bureau station at Goodwater, in Coosa County, a few miles south of Clay County, is about 63° F. Even in July and August the nights are cool, the temperature being modified by breezes from the Gulf of Mexico. Extremely cold weather is rare. The highest temperature recorded at the Goodwater station is 105° F., and the lowest 8° F.

There is probably a difference of several degrees between the temperature of the mountain sections and the areas of higher altitudes, with elevations ranging from 1,200 to 2,200 feet above sea level, and that of the remainder of the county where the elevations range from 800 to 1,100 feet.

The average annual rainfall is about 52 inches, and the precipitation is generally well distributed throughout the year. For the wettest year recorded the total rainfall is reported as about 75 inches, and for the driest year about 35 inches.

The average date of the last killing frost in the spring is March 20 and that of the first in the fall, November 9. The latest date of killing frost recorded in the spring is April 8 and that of the earliest in the fall October 18. There is a normal growing season of 234 days, which is long enough for the production of all the important crops of the region. Garden products, peaches, and cotton in the higher lying areas are practically never injured by frost in the spring or fall.

The data in the following table, giving the normal monthly, seasonal, and annual temperature and precipitation, are compiled from the records of the Weather Bureau station at Goodwater.

Normal monthly, seasonal, and annual temperature and precipitation at Goodwater, Coosa County.

[Elevation, 826 feet.]

Month.	Temperature.			Precipitation.		
	Mean.	Absolute maximum.	Absolute minimum.	Mean.	Total amount for the driest year.	Total amount for the wettest year.
	° *F.*	° *F.*	° *F.*	*Inches.*	*Inches.*	*Inches.*
December	44.5	76	9	4.32	1.05	7.38
January	44.0	74	7	4.93	3.20	4.08
February	43.4	77	− 8	6.17	4.33	10.28
Winter	44.0	77	− 8	15.42	8.58	21.74
March	56.5	87	14	6.08	8.38	5.85
April	61.9	92	26	3.86	3.90	6.10
May	71.8	100	40	3.86	.10	2.30
Spring	63.4	100	14	13.80	12.38	14.25
June	78.2	103	48	3.91	3.18	10.35
July	80.5	105	56	5.44	4.16	6.60
August	80.2	105	58	5.32	3.62	4.79
Summer	79.6	105	48	14.67	10.96	21.74
September	75.8	102	37	2.56	.94	3.44
October	63.8	97	30	2.45	0	8.74
November	54.2	87	21	3.09	1.78	5.57
Fall	64.6	102	21	8.10	2.72	17.75
Year	62.9	105	− 8	51.99	34.64	75.48

AGRICULTURE.

The first settlement in this part of Alabama was made in 1819. Augusta, Ga., and Charleston, S. C., were the nearest markets, and the early agriculture was chiefly of the self-sustaining type. The leading crop was corn. Some cotton and wool were produced for making homespun clothing. At a later date, prior to the Civil War, Columbus, Ga., on the Chattahoochee River, and Wetumpka, Ala., on the Coosa River, became important markets and cotton was grown extensively, chiefly on large plantations in the southern part of what is now Clay County. No fertilizers were used, legumes were not grown, and crops were not rotated, but when the productiveness of the soil decreased the land was abandoned and new fields were cleared. Corn, wheat, oats, rye, and barley were grown for home use. During the Civil War agriculture was largely discontinued, but the high prices received for cotton after the war gave a strong impetus to the production of this staple. There was a steady increase in the acreage of this crop between 1880 and 1910. The variation in yield in the last four census years has been slight, the average yield being about two-fifths bale per acre.

At present cotton is by far the most important cash crop of the county. The 1910 census reports a total of 33,690 acres in cotton in 1909, with a production of 13,179 bales. Corn ranks next to cotton in importance, but is used almost entirely on the farm, chiefly for fattening hogs and feeding the work stock. This crop is reported on 30,932 acres in the 1910 census, with a production of 406,095 bushels. It is reported that a larger acreage was devoted to corn in 1914 than to any other crop, a sufficient supply being grown, for the first time, to meet the local demand. Oats occupied 4,289 acres in 1909, with a total production of 44,989 bushels. This crop is used for feeding the work stock. It has increased in importance in recent years, largely because of the growing interest in crop rotation. Wheat is reported on only 343 acres in 1909.

The most important of the minor crops are hay and sweet potatoes. In 1910 there were 786 acres in cultivated grasses, and 331 acres in wild grasses, with 1,001 acres in grains cut for hay. The hay and forage crops are used exclusively for feed for stock on the farm. In the same year there were 1,347 acres in cowpeas. This crop is grown for the seed, for hay, and for soil improvement, and is increasing in importance. A total of 845 acres was in sweet potatoes, 87 acres in Irish potatoes, and 611 acres in all other vegetables combined. Sweet potatoes are grown for home use and for sale at local markets. Some peanuts, sorghum, and sugar cane for sirup are grown on many farms, as well as a small acreage of barley, rye, and millet.

The 1910 census shows nearly 50,000 peach trees, about 41,000 apple trees, and about 5,000 grape vines in the county. These fruits are used mainly at home or sold at local markets, though a small part of the fruit produced is shipped to Anniston, Talladega. and other outside markets.

While cotton growing and general farming are the principal types of agriculture in Clay County, a few farmers are engaged in raising hogs and beef cattle on a commercial scale. This industry, however, has not yet reached a very important stage of development. The 1910 census reports 6,586 hogs, about 800 calves, and 3,432 other cattle sold or slaughtered in 1909. About $60,000 worth of beef cattle were shipped from the county in 1914. In general; the hogs raised are of better quality than other live stock. The leading breeds are the Berkshire, Duroc Jersey, and Poland China. Dairying is not important in the county. Some farmers keep one or two cows, and occasionally more, chiefly to supply milk and butter for home use. In a few cases butter is sold at local markets. The Jersey grade is the most common type of dairy cow. Not enough horses and mules are raised in the county to supply the local demand.

In addition to the native grasses, pastures of oats, rye, Johnson grass, lespedeza, Bermuda grass, and other crops are sometimes provided for the cattle. The pasture grasses are supplemented with concentrates and dry feed, consisting of corn, oats, sorghum, corn fodder, and cowpea-vine, beggarweed, and other kinds of hay. Horses and mules are fed on about the same roughage as the cattle, with corn, oats, alfalfa meal, and various mixed feeds. Corn constitutes the principal feed for hogs.

The Dekalb, Talladega, and Chandler soils are too rough for the growing of cotton, corn, and oats, except in small areas where the slopes are gentle and the ridge tops broad. The farmers in general realize that this rough land is best adapted to the raising of beef cattle, and it is used to some extent for grazing stock.

Very little attention is given to following the natural adaptedness of the various soils to certain crops. In general, the same crops are grown on practically all the soil types, about the same methods of farming are used, and the same kinds and quantities of commercial fertilizer are applied. It is realized that the Iredell loam, especially where the bedrock is within 1 or 2 feet of the surface, is the least desirable soil in the county for cotton, and that grain does better on this soil than other crops. It is generally recognized that corn does best on the Congaree soil where not too wet, and on the dark "mulatto" clay loam of the Cecil series.

Improved agricultural methods are steadily gaining in favor. Farmers plow the land more deeply than formerly, and cultivate the crops more frequently and thoroughly. Subsoiling is done, with con-

siderable benefit, in a few cases, and contour plowing, ditching, and terracing are commonly practiced where the surface is so rolling as to cause erosion.

The common method of preparing the land for cotton is to make a succession of beds by throwing furrows together, and to follow this by rebedding. Cotton is given clean cultivation. Two hoeings, for thinning the crop, are followed by several cultivations, which keep the weeds down and help to maintain a surface mulch. Corn is given less attention, but level cultivation is practiced by the majority of farmers, and the crop generally is cultivated twice after it is above the ground. Oats are either sown broadcast or with a drill. The better results are obtained where the latter method is used.

Crop rotations are practiced by only a comparatively few farmers, although their value is generally recognized. The most common rotation is the growing of corn after cotton, and sowing cowpeas with the corn or after oats, following with cotton or corn. Commercial fertilizers are used for cotton, corn, and the small grains. In the 1910 census an expenditure of $93,060 for fertilizer is reported. A mixture analyzing 10–2–2[1] is used far more than any other. Some farmers mix their own fertilizer, using acid phosphate and cottonseed meal. In applying commercial fertilizers practically no attention is given to soil differences. For cotton, from 150 to 500 pounds per acre is applied to the bed before planting. From 100 to 200 pounds per acre is applied to corn at the second cultivation. A top dressing of 70 to 100 pounds per acre of nitrate of soda is sometimes applied to oats early in April. The soils throughout the county are greatly in need of lime. Liming would be of especial benefit on fields designed for growing the legumes, especially alfalfa. Little stable manure is available. It is a common practice to burn the stalks or vines from the land in order to facilitate breaking, and in this way considerable vegetable matter that should be cut and turned under is wasted. It is possible that the Appling and Cecil soils need more nitrogen and less potash than the 10–2–2 mixture supplies. The Talladega, Chandler, Conasauga, and Iredell soils may need more potash.

While old-style equipment is used in some localities, the one-horse plow, capable of stirring the soil to a depth of only 3 or 4 inches, and the narrow-tooth implements with sweeps used in subsequent cultivation are gradually giving way to two-horse turning and disk plows and harrows for the preparation of the land, and to multiple-tooth cultivators for subsequent cultivation. Where farmers have only a few acres of small grain or hay, or the fields are very stumpy or rocky, the cradle and scythe are used in harvesting, but in all cases where the fields are large and well cleared the binder and mowing

[1] 10 per cent phosphoric acid, 2 per cent nitrogen, and 2 per cent potash.

machine are used. Mules are preferred as work animals, being more easily kept and enduring the warm weather better than horses. Oxen are used to some extent in the rougher sections, especially in clearing and breaking new land.

Farm labor is plentiful. Laborers are paid from $10 to $15 a month or 75 cents to $1 a day when hired for shorter periods. There is little demand for labor, as the farms are small, ordinarily including only 25 to 40 acres of cultivable land. The average family is large enough to do most of the work, and the women and children generally assist with the lighter work in the fields. The census reports a total expenditure in 1909 of $39,545 for labor in Clay County.

The size of the farms depends somewhat upon the topography from place to place. The largest farms are in the rough areas of the Talladega, Chandler, Louisa, and Mecklenburg soils, while the farms are relatively small on the Appling, Conasauga, Altavista, Congaree, and Wehadkee soils and in the smoother areas of the Louisa, Cecil, and Mecklenburg soils. The 1910 census reports 3,459 farms in Clay County, of an average size of 73.8 acres, each tenancy being classed as a farm. Of the area of the average farm, 31.6 acres, or about 43 per cent is reported improved. Of the total area of the county, 65 per cent is reported in farms.

According to the same authority 52.4 per cent of the farms are operated by owners and the remainder by tenants. In renting farms the share system is the most common and the most satisfactory. The owner usually directs the farm operations, so that a crop sufficient to cover the rent is insured. Ordinarily where the landlord supplies the work stock and tools he receives one-half the crop. Where the tenant supplies these in addition to his labor the landlord receives one-third of the cotton and one-fourth of the corn. In some cases 2 bales of cotton constitutes the annual rental for a 30-acre farm. Where land is rented for cash, which is very rarely the case, a rental of $3 to $4 an acre is paid.

The selling price of the better farming land ranges from $15 to $100 an acre, the valuation depending on the quality of the soil, the topography, improvements, and the accessibility of markets. The highest priced lands, excluding locations near the towns, are the Cecil loam and clay loam, the Appling sandy loam, the Congaree silt loam, and the Altavista loam. The more rolling lands, together with the shallow areas of Iredell soil, sell for $1 to $15 an acre. The average assessed value of farm land is given in the 1910 census as $8.30 an acre.

SOILS.

The soils of Clay County may be classed, on the basis of origin, in three general groups, residual, alluvial, and colluvial. About 96 per cent of the area consists of residual soils, 3 per cent of alluvial

soils, and 1 per cent of colluvial soils. The residual soils are derived in place from the decay of the underlying rocks. The alluvial soils are derived from material washed from the residual soils and deposited over the flood plains of streams. The colluvial soils are composed of materials transported down slopes by gravity, assisted by the movement of water and by freezing and thawing.

The rocks of Clay County from which the upland soils are derived consist of schists, gneisses, granites, diorites, phyllites, and slates, with some shale and quartzite. A conglomerate occurs near Pyriton, resting unconformably upon the shale, and sandstone occurs near Bull Gap, resting upon the quartzite, but these formations are of too small extent to have had much influence on the soils. With the exception of the conglomerate, all the formations are highly tilted and are more or less faulted.

A mica schist formation occurs in a zone 6 to 14 miles wide, traversing the county from the northeast corner to the southwest corner. This zone is very much cut up by diorite and granite dikes. The formation includes highly metamorphosed crystallines and semicrystallines. The rocks consist of hydromica schists containing decomposed feldspar, muscovite, and biotite micas and iron, an argillaceous mica schist, sericitic schist, garnetiferous schist, hornblende schist, graphitic schist, epidote schist, quartz schist, and phyllites.

The granite formation outcropping in the vicinity of Pinkneyville is a gray granite composed of orthoclase feldspar, hornblende, mica, and quartz, the feldspar weathering into kaolin. A binary granite appears in the vicinity of Mellow Valley and Cragford. This originally was composed of quartz and feldspar, but the feldspar here also has broken down through weathering into kaolin. A granite-gneiss formation extends from near Flatrock in a southwesterly direction, about parallel with the Talladega Mountains, to the Talladega County line.

Occurrences of dark-colored, basic, igneous dikes appear in a series of high, parallel ridges. These are a part of Red Ridge, and occur in a belt 3 to 4 miles wide extending from the Cleburne County line north of Delta in a southwest direction to the Talladega County line. These rocks are mainly diorites, which have been metamorphosed and have a schistose structure. There are also hornblende schists and other dark ferro-magnesium schists.

The Hillabee green schist is an altered, fine-grained rock, generally of an olive-green color. It occurs in the vicinity of Dempsy, Millerville, Coleta, Brownsville, and Hollins, and in the northeast corner of the county. In places numerous veins of quartz are present in this formation.

The Talladega phyllite represents the parent material of most of the soils of the Appalachian Mountain province. It also occurs

in the Piedmont Plateau section, in the southeastern quarter of the county, in a broad belt extending from northeast to southwest. The rocks are metasedimentary and consist mainly of fine-grained, olive-green to drab phyllites with some slates and thinly laminated schists. Numerous veins of quartz are present in this formation. Carboniferous fossils have been found[1] in the Talladega phyllite formation near Erin, indicating that a part of this formation belongs to the Carboniferous.

A shale formation occurs in long, narrow bands adjoining the lower southeastern or eastern slopes of the Talladega Mountains. It varies from a very fine grained, thinly laminated, brown to black carbonaceous shale to a gray slate or phyllite with a pearly luster. Numerous quartz veins occur in these shale beds. Carboniferous lepidodendrons have been found[1] in this formation in a railroad cut 1 mile southwest of Erin.

A quartzite formation caps the crest of the Talladega Mountains. It is composed of a metamorphosed sandstone, which has been recemented by silica.

Fluviatile material has been deposited along many of the creeks at a level of 5 to 20 feet above the present flood plains. This material consists mainly of loam, but ranges from sand to silt loam. The flood-plain material is Quaternary in age. It varies in character, texture, and structure, depending upon the nature of the parent material and the conditions of deposition.

The soils of Clay County occur in two physiographic provinces. Those in the western part belong to the Appalachian Mountain province and the remainder to the Piedmont Plateau. They are grouped into series on the basis of common origin and similar characteristics of color, structure, and topography. There are nine upland series, the Talladega, Chandler, Conasauga, and Dekalb belonging to the Appalachian province, and the Louisa, Cecil, Appling, Iredell, and Mecklenburg belonging to the Piedmont Plateau province. The Talladega and Chandler series owe their origin to the decomposition of the Talladega phyllite, the Conasauga to the shale formation, and the Dekalb to the quartzite. The Louisa series has been formed, through decomposition, from the Talladega phyllite and the mica schist, the Cecil from the granite and the dark, igneous dikes, the Appling from the binary granite, and the Iredell and Mecklenburg from the Hillabee schist.

The bottom-land soils are classed mainly in the Congaree series, but include small areas of Wehadkee soil in the flood plains and of Altavista soil at a higher elevation on the stream terraces.

[1] By Dr. Eugene A. Smith, State Geologist of Alabama.

The soils of the Louisa series are predominantly grayish in the surface soil and red in the subsoil, with a characteristic greasy feel, owing to the mica and partly weathered rock material present. The soil is derived chiefly from the underlying micaceous schists, which consist of hydromica schists containing decomposed feldspar, muscovite and biotite mica, and iron. To a less extent the material is derived from argillaceous, thinly laminated mica schist, sericitic schist, garnetiferous mica schist, hornblende schist, graphitic schist, quartz schist, and phyllite. The Louisa stony loam, slate loam, gravelly sandy loam, gravelly loam, loam, and clay loam types are encountered in Clay County.

The Cecil series has gray to red surface soils and red clay subsoils. Small fragments of quartz are commonly present throughout the 3-foot section. These soils are of residual origin and are derived principally from dikes of dark igneous rocks, mainly diorite, with some hornblende schist and other schists, and also from the weathering of granite and gneiss. The topography is rolling, with level to undulating areas where stream erosion has not been active. The Cecil series is represented in Clay County by the stony loam, sandy loam, loam, and clay loam types.

The Appling soils are characterized by the grayish to pale-yellow color of the surface soils and the mottled or streaked red and yellow color of the subsoils. In places the color varies from yellow to red in different situations, while grayish or drab colors occasionally are present in the subsoil. These soils are derived principally from binary granite, except in a few cases where the formation is a granite gneiss. In all occurrences the feldspar is completely broken down into kaolin. The topography is rolling to hilly, with level to undulating areas in situations where extensive stream erosion has not occurred. The Appling sandy loam and gravelly loam are mapped in Clay County.

The soils of the Iredell series are light brown to almost black in color, and frequently carry small iron concretions. The subsoils consist of extremely plastic, sticky or waxy, clay of yellowish-brown to greenish-yellow color. Disintegrated rock is encountered in many places within the 3-foot section. The topography varies from nearly flat to gently rolling. The material is derived chiefly from the Hillabee schist and in places from diorite. The intractable subsoil in places lies near the surface, making cultivation difficult, but in areas where the soil is deep and has a texture lighter than a clay a good seed bed can be maintained. In Clay County the Iredell loam and stony loam are mapped.

The Mecklenburg soils have reddish-brown to red surface soils and yellowish-brown, stiff clay subsoils, grading usually into disinte-

grated rock within the 3-foot section. The upper part of the subsoil frequently has somewhat the characteristics of the Iredell series. In this county the material is derived from the green Hillabee schist. In some places the soils appear to represent Iredell material in an advanced stage of weathering. The topography is gently rolling and the surface drainage is good. Only the Mecklenburg clay loam type is encountered in Clay County.

The Talladega series is characterized by grayish-brown to light-brown surface soils, underlain by red subsoils having a greasy feel. The series is developed in the mountainous section of the county. The material is derived from metamorphic rocks, principally micaceous schists or phyllite (Talladega phyllite).

The Chandler series represents the yellow-subsoil equivalent of the Talladega series. The surface soils are grayish to light brown; the subsoils are yellow to reddish yellow and have a greasy feel. The material is derived from metamorphic rocks, chiefly from micaceous schists or phyllite (Talladega phyllite). The Chandler gravelly loam, the only member of the series mapped, occurs in the mountainous portion of the county.

The surface soils of the Conasauga series are light brown, and the subsoils are yellow. These soils occur typically in flat to gently rolling valley areas. The material is derived from thinly laminated shale, argillaceous slate or phyllite. The Conasauga gravelly loam is encountered in Clay County.

The Dekalb series is characterized by the grayish color of the surface soil, the yellow color of the subsurface material, and the reddish-yellow to pinkish color and friable character of the subsoil. The material is derived from grayish, yellowish, and slightly pinkish quartzite. These soils occur in the Blue Ridge division of the Appalachian Mountain system. In Clay County the Dekalb gravelly loam is mapped.

The surface soils and subsoils of the Congaree series are brown to reddish brown, there being comparatively little change in texture, structure, and color from the surface downward. Occasionally grayish and yellowish mottling is encountered in the subsoil of poorly drained areas. These soils are developed in the overflowed first bottoms of streams of the Piedmont region and in similar positions in the Coastal Plain along streams issuing from the Piedmont. The material is composed chiefly of wash from soils of the Piedmont region. In Clay County only the Congaree silt loam is mapped.

The alluvial lands include small areas of Wehadkee and Altavista soils. Typically, the Wehadkee surface soils are of gray color, compact structure, and prevailingly silty texture; the subsoils are of mottled grayish and yellowish or white color, compact structure,

and prevailingly clay to silty clay texture. These soils are developed in the first bottoms of streams, and consist of alluvial materials derived from Piedmont soils. They are subject to overflow. The Wehadkee silt loam is mapped in Clay County.

The Altavista series consists of gray surface soils and yellow or mottled yellow and gray subsoils. The series occurs on terraces or second bottoms along streams lying above normal overflow. The Altavista soils are encountered in the Piedmont region. Typically the material is alluvial in origin, consisting of wash from the residual soils, but in places near footslopes some colluvial material is mixed with the alluvial deposits. In this survey the Altavista loam type is encountered.

The areas mapped as Rough stony land are too steep and stony for crop production, and are suitable only for forestry or grazing. These areas are due to the occurrence of beds of quartzite in the Talladega Mountains, this formation being very resistant to weathering.

The various series are divided into soil types on the basis of texture. Twenty-two types, exclusive of Rough stony land, are mapped in Clay County, and these are described in detail, in connection with their relation to agriculture, in the following pages.

The following table gives the name and the actual and relative extent of each soil type mapped:

Areas of different soils.

Soil.	Acres.	Per cent.	Soil.	Acres.	Per cent.
Louisa loam	69,504	18.0	Dekalb gravelly loam	5,248	1.4
Louisa stony loam	65,408	17.0	Iredell loam	3,840	1.0
Talladega slate loam	45,056	11.7	Mecklenburg clay loam	2,368	.6
Louisa slate loam	31,936	8.3	Cecil sandy loam	2,176	.6
Louisa gravelly loam	28,480	7.4	Conasauga gravelly loam	2,112	.5
Cecil clay loam	21,888	5.7	Cecil loam	1,856	.5
Rough stony land	21,696	5.6	Altavista loam	1,664	.4
Congaree silt loam	21,248	5.5	Louisa gravelly sandy loam	1,600	.4
Louisa clay loam	19,136	5.0	Appling gravelly loam	1,024	.3
Cecil stony loam	13,120	3.4	Wehadkee silt loam	896	.2
Appling sandy loam	10,624	2.8			
Chandler gravelly loam	8,192	2.1	Total	385,280	
Iredell stony loam	6,208	1.6			

LOUISA STONY LOAM.

The Louisa stony loam in color, structure, and texture of the fine soil material is similar to the Louisa gravelly loam and loam. The larger size of the fragments of schist and quartz and the rougher topography constitute the chief differences between this type and the gravelly loam. The surface soil consists of 6 to 10 inches of a brown

to brownish-yellow, loose loam. It passes into a brownish-yellow or reddish-yellow, heavy loam or silty clay loam, which grades at about 10 to 15 inches into a light-red or red, brittle clay. This clay often contains sufficient partially decomposed rock material to give it a greasy feel. A large quantity of angular quartz fragments, platy mica schist, and fragments of other rocks are scattered over the surface and are often encountered in the subsoil at varying depths. In many places the partially decomposed bedrock is encountered at a depth of about 2 to 3 feet. The type includes patches of Louisa gravelly loam, loam, and clay loam which are too small to be shown separately on the soil map.

The Louisa stony loam is the second most extensive type in the county. It is widely distributed throughout the Piedmont Plateau section, occurring mainly in broad, irregular belts, extending in a northeast-southwest direction. The type is not very important agriculturally, owing to its rough surface. The topography is characterized by long, narrow ridges, with steep slopes, minutely dissected. In small areas, however, the ridges are broad enough or the slopes sufficiently gentle for cultivation. The drainage is generally excessive, and never insufficient.

Probably not much more than 10 per cent of the Louisa stony loam is arable land. In addition to agriculture, lumbering and graphite mining are important industries. The type is mainly forested with longleaf and shortleaf pine, white, red, post, Spanish, and blackjack oak, chestnut, hickory, beech, poplar, wild cherry, plum, and dogwood. In general, its best use is for forestry and grazing, the land being too stony, steep, and broken for general farming. Cotton and corn do fairly well on the broader ridges and gentler slopes, but the abundance of stones is a great hindrance to cultivation. The southeast slopes of the higher hills and mountains are good sites for orchards and early gardens because of the protection from frosts. Cowpeas, soy beans, and Bermuda grass have been grown successfully on this soil.

Excepting the work stock, a few cows to supply milk and butter, and one or two hogs to furnish meat, no stock is kept by the majority of the farmers. A few, however, have small herds of beef cattle, and find the production of beef profitable. The cattle are grazed on the rough pasture land.

On this type very little attention is given to crop adaptation or crop rotation, the growing of legumes, the incorporation of organic matter or to seed selection. Commercial fertilizer, usually a 10–2–2 mixture, is commonly used in growing cotton and corn.

Land values range from $3 an acre for the much-dissected land without marketable timber to $20 an acre for the better improved land.

Grazing beef cattle in the nonarable areas of this soil offers good opportunities. Careful attention should be given to the prevention of washing and gullying where cotton and corn are grown. Proper terracing, ditching, and contour plowing, and the keeping of oats, rye or some other cover crop on the land throughout the winter are beneficial.

LOUISA SLATE LOAM.

The Louisa slate loam consists of 5 to 8 inches of a light-brown to reddish-brown loam, underlain either by a red, brittle clay having a greasy feel or by a yellow loam which grades into red clay. Partially decomposed schist or phyllite is commonly encountered within the 3-foot section, usually within 18 or 20 inches of the surface. Platy fragments of schist or phyllite are numerous on the surface and are present to a smaller extent throughout the soil section. On the gentler slopes, where the underlying rock is not encountered within the 3-foot section, the surface soil is deeper and the subsoil is a red clay with a decidedly greasy feel. In several small areas, of a few acres each, the presence of graphite has given a dark-gray color to both soil and subsoil and a metallic luster is very noticeable throughout the 3-foot section. Such areas would be mapped as the Piedmont equivalent of the Ranger stony loam if of sufficient extent.

This type occupies a belt in the southeastern part of the county from 3 to 6 miles wide, extending southwestward from Cragford into Tallapoosa County. The soil occurs on the tops and steep slopes of rough, broken ridges which are very much dissected by gullies and valleys, and have a northeast-southwest trend. The drainage is generally excessive owing to the laminated, fissile, and minutely jointed structure of the underlying phyllite formation, which permits the water to seep downward readily, being carried away through the bedding and joint planes of the rock to the gullies. The type is fairly important as an agricultural soil. General farming is the leading industry, and lumbering, on a small scale, is carried on.

About 25 per cent of the Louisa slate loam is cleared and under cultivation; the remainder is largely forested with longleaf pine and oak, and is used to some extent for grazing. The uncleared areas seem best suited to forestry and grazing.

Cotton and corn are the leading crops, but the yields of both are below the average for the county. Oats do fairly well. This crop is seldom thrashed, being used either for hay or pasture, or fed in the sheaf. Apples, peaches, and Scuppernong grapes do very well, but are not grown on a commercial scale. Cotton is the money crop, corn being grown mainly as feed for stock. Yields of cotton range from one-fourth to one-half bale and of corn from 10 to 17 bushels per acre.

Very little attention is given to crop rotation, crop adaptation, the growing of legumes or to seed selection. A 10–2–2 fertilizer mixture is commonly used for cotton and corn.

Land values range from $10 to $30 an acre, depending upon the topography, the timber, and the general improvements. The average value is about $15 an acre.

Owing to the roughness of the surface, the abundance of stone and gravel, and the inferior quality of the soil, the greater part of this type is best suited to grazing and forestry. Beef cattle could be raised profitably, largely by grazing. If suitable markets were accessible the growing of apples, peaches, and Scuppernong and other grapes probably could be made a profitable adjunct to general farming and stock raising. More legumes should be grown and all organic matter should be turned under instead of being burned.

LOUISA GRAVELLY SANDY LOAM.

The surface soil of the Louisa gravelly sandy loam is 5 to 10 inches in depth. It consists of a pale-yellow to dark-gray, loose fine sandy loam. Angular fragments of vein quartz are sufficiently abundant to give the material a gravelly character and to affect tillage. The surface soil is underlain by a yellow loam, which grades at a depth of about 15 inches into a red clay. This clay has a greasy feel and is moderately friable. It may continue to a depth of 36 inches or more, but occasionally the underlying hydrated mica schist, cut by numerous veins of quartz, is encountered within the 3-foot section.

This type is mapped in the southeastern corner of the county. It occurs in two areas, which together cover 2.5 square miles. The type occupies smooth ridges and gentle valley slopes. The drainage is good and excessive on some of the narrower ridges or steeper slopes.

Practically all the Louisa gravelly sandy loam is cleared and in cultivation. Cotton, corn, oats, cowpeas, garden crops, and fruit are grown with about the same results as on the Louisa loam.

A few progressive farmers mix their own fertilizer according to the needs of the soil, rotate the crops, grow legumes, plow the land deeply in the fall, and turn under organic matter, but the majority follow the old method of using ready-mixed commercial fertilizer, of a 10–2–2 grade, on cotton, corn, and grains, plowing shallow, and burning off the cotton stalks and other organic matter.

Land values on this type range from $15 to $40 an acre, with an average of about $25.

LOUISA GRAVELLY LOAM.

The Louisa gravelly loam in color, structure, and texture of the fine soil material is similar to the Louisa loam; it is distinguished from that type mainly by the presence of large quantities of gravel

and small rocks. The surface soil is a brown to brownish-gray, light loam about 6 to 10 inches deep. It contains varying quantities of angular quartz fragments and flattish fragments of schist, ranging in size from fine gravel to pieces 8 inches in diameter. The subsoil is a light-red or red, brittle clay, containing enough of the partially decomposed rock material to give it a greasy feel. Quartz and schist gravel occur throughout the subsoil. Frequently the highly weathered bedrock formation, which is usually a hydromica schist, is encountered at depths of 2 to 3 feet, and outcrops are common. In both soil and subsoil the quartz gravel is more abundant than the schist, because of its relative insolubility.

This type is well distributed throughout the Piedmont section of the county. It generally occurs on the crests and steep slopes of ridges, but may be found on the broad ridges and gentle slopes. The drainage is thorough and is excessive on some of the narrow ridges and steep slopes.

Owing to its large area and fair agricultural value, this is an important type. It is used mainly for general farming. During the winter season industries of considerable importance are the cutting of crossties and logs and the operating of small sawmills. Probably 50 per cent of the type is under cultivation. The remainder is too steep and broken for farming, and is forested with about the same growth as the Louisa loam.

The most important crop and about the only cash product is cotton. Corn and oats give good yields, but are grown mainly for feed. Cowpeas are successful, but are grown to only a small extent. Bermuda grass makes good pasturage, and is grown by a few farmers. Melons, vegetables, and other garden products do well on this soil, but are produced only for home use. Most of the farms have small orchards of apples, peaches, and plums. These fruits do well, but are not grown on a commercial scale. Cotton yields from one-fourth to three-fourths bale per acre, corn from 10 to 25 bushels, and oats from 10 to 40 bushels. The methods of handling the soil and the use of fertilizers are about the same as on the Louisa loam.

Land values range from $15 to $30 an acre, with an average of about $20.

There is a general need on this type for deeper plowing, the use of legumes in some system of rotation, and the turning under of all organic matter instead of burning it off. The raising of stock, especially beef cattle, would probably prove profitable where there is much waste land available for pasture. These rougher areas should not be cleared, but should be used for grazing and reforesting. Cultivation of the steeper arable slopes is likely to be followed by gullying unless the slopes are terraced or seeded to soil-binding crops, such as Bermuda grass.

LOUISA LOAM.

The Louisa loam consists of 6 to 10 inches of a brown, light-brown or reddish-brown, rather light loam, underlain by a reddish-yellow to red loam or clay loam which passes quickly into a light-red or red, brittle clay. The clay often contains sufficient partially decomposed rock material to give it a greasy feel. The surface soil carries a relatively high percentage of fine sand and contains a large number of small, angular quartz fragments. A considerably smaller quantity of small quartz fragments is found in the clay subsoil, but hydromica schist and other schist fragments are very common where the partially decomposed rock is encountered within the 3-foot section.

The type as mapped is not uniform, a number of variations occurring. On the lower, gentler slopes the surface soil is deeper and the subsoil color is a lighter shade of red. On steep slopes, where erosion has occurred, there frequently is either a heavy red loam or red clay loam at the surface. The type includes small patches of the Louisa stony loam and gravelly loam and the Appling loam.

The Louisa loam is the most extensive soil type in the county. Its principal occurrence is in a wide belt extending from the vicinity of Ashland to the northeastern corner of the county. The topography is gently rolling to rolling, and the drainage is generally good and in places excessive on the steep slopes and narrow ridges and where the underlying rock is near the surface.

This is an important soil agriculturally. Probably 80 per cent of the type is under cultivation; the remainder is forested with a growth of longleaf pine, shortleaf pine, rosemary pine, white oak, red oak, post oak, Spanish oak, blackjack oak, chestnut, hickory, beech, poplar, ash, and plum.

Cotton is the most important crop, followed by corn, grown chiefly as feed for hogs and work stock. Oats are grown for grain, hay, and pasturage, but the crop is of much less importance than corn. Cowpeas are grown by all the better farmers as a soil-improving crop and for forage. Sorghum is grown for sirup and for stock feed. There are a few very good fields of Bermuda grass and lespedeza. Vegetables, melons, and other garden crops common to the region are grown on this type successfully, but not in sufficient quantities to supply the local markets. Most farmers have small orchards, in which apples, peaches, and occasionally pears are produced for home use, with a small surplus for local markets. The Scuppernong grape does very well, and a few vines are found on most of the farms. Stock raising is of little importance. Few cattle and hogs are sold, and not all the farmers keep cows to supply milk and butter for their own use. On most of the farms enough hogs are raised to supply the home with pork.

Cotton yields range from one-fourth to 1 bale per acre, averaging somewhat less than one-half bale; corn yields from 10 to 30 bushels per acre, with an average of about 15 bushels, and oats from 10 to 70 bushels, with an average of about 15 bushels.

The differences in yields are due mainly to different methods of fertilizing and cultivating the crops. The maximum yields are obtained where cowpeas or other legumes are used in a crop rotation, and where the farmers understand and supply the fertilizer needs of the soil. Turning under organic matter, deep fall plowing, and careful seed selection have given excellent results. Little attention is given to the rotation of crops, aside from the occasional change from cotton to corn and the growing of cowpeas with the corn.

Commercial fertilizer, usually a 10–2–2 mixture, is ordinarily used for cotton and corn, but where better farming methods prevail and the soil has been built up phosphates alone give good results.

Land values range from $10 to $60 an acre, with an average of about $25.

Some of the needs on the Louisa loam are crop rotation, the growing of legumes, deep fall plowing, the addition of organic matter, terracing the steeper slopes and putting them in soil-binding crops, a discontinuance of the practice of burning off the organic matter from the fields, the growing of more Bermuda grass and lespedeza for pasture, and the raising of more stock, especially beef cattle and hogs. This soil is well suited to the type of farming practiced, that is, general farming consisting of the production of cotton for market and of corn for the manufacture of cornmeal for domestic use and for stock feed. The raising of more live stock would encourage the growing of the legumes and other forage crops and would make larger quantities of manure available for use on cultivated fields. The transportation facilities are sufficient for shipping live stock.

LOUISA CLAY LOAM.

The Louisa clay loam consists of a reddish-brown loam, 1 to 5 inches deep, underlain by 3 or 4 inches of red, friable clay loam, which grades into a red, friable clay subsoil having a somewhat greasy feel. Ordinarily deep plowing would bring up enough of the clay subsoil to make a clay loam when mixed with the loam at the surface. Angular quartz and flat schist fragments usually are present on the surface and are often found in the subsoil. In many places the parent schist rock is encountered within the 3-foot section. In places on steep slopes erosion has removed the few inches of loam at the surface, exposing the red clay. In places, either stone or gravel is very abundant, both on the surface and throughout the soil mass. Such areas are indicated on the soil map by stone or gravel symbols. Bordering the Mecklenburg and Iredell areas are gradation zones in

which the subsoil is rather plastic and sticky, and where the dark-colored Cecil clay loam areas are approached both the surface soil and subsoil of the Louisa type are darker colored than is typical.

The Louisa clay loam is well distributed throughout the Piedmont plateau section. Its principal occurrence is south of Quenelda. The areas are generally small and irregular, owing to this type having originated through the removal of the surface loam by erosion.

The topography ranges from rolling to rough and mountainous. The type largely occupies narrow ridges and steep slopes. Erosion has been very active, and extensive gullying has resulted. Where this soil is associated with the Louisa loam the ridges are broader and the slopes more gentle than typical. The drainage is good on the gentler slopes and excessive on the steep slopes and narrow ridges.

This is a soil of considerable extent and agricultural importance. General farming, in conjunction with lumbering, is probably the leading industry. Some rather valuable graphite beds underlie this soil and mining is carried on in the west-central part of the county.

About 20 per cent of the type is farmed. The remainder is rough and hilly and is forested chiefly with longleaf and shortleaf pine, white oak, red oak, post oak, Spanish oak, blackjack oak, chestnut, hickory, beech, poplar, ash, plum, and dogwood. The rougher part of the type is best suited to forestry and grazing.

Cotton, corn, and oats are grown on the gentler slopes and broad ridges. Cotton is the money crop, and corn and oats are grown mainly for the work stock and hogs. Stock raising is of very little importance; a few hogs are raised on most farms to supply meat for home use. Almost every farmer grows garden vegetables and has a few apple and peach trees.

Yields are somewhat lower on this type than on the Cecil clay loam, although the methods of farming are about the same.

This land sells for $3 to $40 an acre. It has an average value of about $15 an acre.

Because of the steepness of the slopes, great care is necessary in farming this type. Contour plowing, terracing, and ditching are required to keep the soil from washing. Either rye or oats, as a winter crop after cotton and corn, should be grown to hold the soil. Cattle could probably be raised with profit on this land.

CECIL STONY LOAM.

The Cecil stony loam in color, structure, and texture of the fine soil material is similar to the Cecil loam. The fine earth of the soil consists of about 6 to 10 inches of a brown to brownish-gray loam, overlying a heavy, red loam or clay loam, which grades downward into a red, friable clay at about 14 inches. This generally continues to a depth of 3 feet or more, but in places the underlying granite, granite

gneiss or dark, igneous dike rock is encountered, in a highly decomposed state, within the 3-foot section. Large quantities of angular quartz fragments, irregular pieces of granite gneiss, and fragments of the dark, igneous dike rock are scattered over the surface and are often encountered in the subsoil at varying depths. This type, as mapped, includes patches of Cecil loam and clay loam not sufficiently extensive to warrant separation.

The principal areas of the Cecil stony loam occur in the dark dike ridges of Red Ridge, and extend from west of Delta in a southwesterly direction to Idaho. Other areas are mapped north of Pinkneyville and in the vicinity of Mount Zion Church and Guthries Chapel. Small areas, 20 acres or more in extent, are encountered in other parts of the county.

The surface is rolling to rough and mountainous. The steep slopes have been minutely dissected by streams, and gulches with almost vertical walls are common. The drainage is thorough, and generally excessive.

General farming is the leading industry on the Cecil stony loam. Considerable attention is also given to cutting crossties and logs, and to the operation of small sawmills. About 5 per cent of the type is under cultivation; the remainder is largely forested with longleaf and shortleaf pine, white oak, red oak, post oak, Spanish oak, blackjack oak, chestnut, hickory, beech, poplar, black gum, sweet gum, plum, and dogwood. A few cattle are pastured in the woodland. With the extensive areas available for grazing, there is opportunity for the development of stock raising, provided methods are used which guard against disease. Each farmer keeps one or two dairy cows and a few pigs to supply home needs.

On the gentler slopes and broader ridges cotton, corn, and oats are grown with almost as good yields as on the Cecil loam, but farming is far more difficult on this type on account of the abundance of stones. Cotton is the most important crop. Peaches and Scuppernong grapes succeed on this soil, but are not grown on a commercial scale.

Cotton yields from one-fourth to one-half bale per acre, corn from 10 to 20 bushels, and oats from 10 to 30 bushels. In almost all cases a low-grade (10–2–2) fertilizer mixture is used.

The selling price of this land ranges from $3 to $20 an acre. Owing to the rough surface and the danger of washing, the greater part of this type should remain in forest and permanent grazing land.

CECIL SANDY LOAM.

The surface soil of the Cecil sandy loam, to a depth of about 6 to 12 inches, is a grayish-brown or yellowish-brown to reddish-brown sandy loam which passes into a red, brittle, compact clay that extends

to a depth of 3 feet or more. The underlying coarse-grained granite rock is rarely encountered within the 3-foot section. This type as mapped includes a number of eroded patches of Cecil clay loam and small areas of Appling sandy loam. A few variations are found where the subsoil is somewhat plastic.

This type is of small extent. It occurs mainly in the vicinity of Pinkneyville. The topography is gently rolling, and the drainage is generally adequate. There is some gullying, and the tendency of the soil to wash is in general not properly controlled. The gullies have almost vertical walls and sometimes are as much as 20 feet in depth.

Almost all this type is under cultivation. General farm crops do well where the type has not been damaged by erosion, but eroded spots are so numerous in most places that they materially reduce production, making the yields lower than the average for the county. Cotton and oats, in areas not affected by erosion, do as well as on any other soil in the county, but corn yields are surpassed by those obtained on the Congaree types and the heavier or "mulatto" soil of the Cecil clay loam. The average yield of cotton is about one-fourth bale per acre, and of corn about 10 bushels.

The methods of farming on this land have generally been conducive to erosion. Where proper attention has been given to terracing, contour cultivation, deep fall plowing, crop rotation, the growing of legumes, and the keeping of soil-binding crops on the land during the winter, yields have been at least doubled, the only commercial fertilizer needed being phosphorus. The land is very responsive to good methods, and can be made as productive as any soil in the county.

The selling price of this land ranges from $15 to $40 an acre, with an average valuation of about $20 an acre.

CECIL LOAM.

The Cecil loam is shown on the soil map by inclusion symbol in Cecil clay loam color. The soil is a brown to brownish-gray light loam, underlain at about 8 or 10 inches by a red clay loam, which passes at about 12 inches into a brittle, compact red clay. The surface soil carries a relatively high percentage of fine sand, and contains some angular pieces of white quartz. The underlying gneiss or schist is seldom encountered within the 3-foot section.

Small, irregular areas of this soil occur between Bluff Spring and Pinkneyville, west of Delta, in the vicinity of Heflin School, and southwest of Hills Mill. It is closely associated with the Cecil clay loam and stony loam. The surface is gently rolling to rolling, and is often badly gullied on the steeper slopes. The drainage is generally thorough and may be excessive along the crests of narrow ridges and on steep slopes.

Probably 80 per cent of this type is under cultivation, the remainder being forested. Cotton, corn, and oats are the principal crops. The yields are about equal to those obtained on the Louisa loam. The soil is cultivated in about the same manner as the Cecil clay loam. Land values range from $20 to $50 an acre, averaging about $30 an acre.

CECIL CLAY LOAM.

The typical Cecil clay loam consists of a dark-red or chocolate-brown, friable clay loam, underlain at about 8 to 12 inches by a more compact, but friable, dark-red clay, which shows no important change within the 3-foot section. This soil is called "push land" because it does not scour on the moldboard of a plow. In spots the surface is covered with irregular quartz fragments. Where this type is closely associated with the Mecklenburg clay loam, as between Millerville and Coleta, and is derived from the same formation, the Hillabee green schist, both the soil and subsoil are somewhat sticky and plastic.

A variation from the typical soil, in which the clay loam is lighter colored, occurs in the vicinity of Brownsville. The surface material here is a red, friable clay loam, grading at about 10 inches into a red, friable clay which continues to a depth of 3 feet or more. In another variation the stones are very numerous on the surface and are encountered in the subsoil, but the fine material is similar to that of the typical soil. Such areas are shown on the soil map by stone symbols. In other cases where gravel is very abundant the gravel symbol is used.

The Cecil clay loam is an extensive type in the county, covering a total area of 34.2 square miles. The principal areas occur on the crests and sides of the dark, igneous dike ridges belonging to Red Ridge. These enter Clay County in the northeastern corner and extend southwestward, some passing into Talladega County a few miles west of Idaho, and others continuing southward to the vicinity of Coleta. Small areas of this type are well distributed throughout the Piedmont Plateau portion of the county, except in the southeastern quarter.

The topography of this type varies widely. It ranges from sharp ridges with steep, minutely dissected slopes to broad ridges with gentle slopes. The drainage is thorough. Erosion is serious on this soil, and great care is required in ditching, terracing, and contour plowing in order to prevent washing.

This is a very important agricultural soil. It is the most productive of the upland soils, and shows the effects of fertilization the longest. The growing of cotton in connection with general farming is the leading industry. About 75 per cent of the Cecil clay loam is under cultivation, the remainder being mainly rough or very broken

land, best adapted to forestry and grazing.. The present forest growth consists of longleaf pine, shortleaf pine, rosemary pine, white oak, red oak, Spanish oak, post oak, black gum, sweet gum, chestnut, hickory, poplar, and dogwood.

Cotton is the money crop and is grown on all the farms. The darker variation of this type is the best upland soil in the county for corn. Cowpeas are grown on a large number of the farms. Soy beans, crimson clover, and bur clover do well, but are grown only in small patches. Bermuda grass and lespedeza are grown successfully for pasture. At the higher altitudes peaches are grown on this type more extensively than on any other soil, but only a very small part of the crop is shipped to markets outside the county. Apples and Scuppernong grapes do well. Little attention is given to stock raising.

Cotton yields average about one-half bale per acre, although yields of 1 bale or more are commonly obtained under improved methods of farming. Corn yields an average of about 18 bushels, and oats about 20 bushels, per acre. The yield of pea-vine hay averages about 1½ tons per acre.

While a few farmers mix their own fertilizer, the majority use commercial mixtures of the formula 10–2–2. A few farmers have increased yields materially by following a crop rotation including cowpeas or some other legume, the vines and stalks being turned under. Almost all the farmers devote some attention to contour plowing, ditching, and terracing to keep the soil from washing.

The selling price of land of the Cecil clay loam ranges from $10 to $60 an acre, depending on the topography, improvements, and location with respect to roads and markets.

This soil is subject to destructive washing, and it is necessary to terrace the land, to plow with the contour, and to keep the steeper slopes in soil-binding crops, such as Bermuda grass. Growing winter cover crops of rye or oats after corn and cotton is an aid in controlling erosion.

There is no apparent reason why beef cattle could not be profitably raised for market on this land, especially in view of its adaptation to a wide range of forage crops and to grass.

APPLING SANDY LOAM.

The surface soil of the Appling sandy loam consists of a light-gray, loose, porous sandy loam about 2 or 3 inches deep, containing a very small quantity of organic matter, and underlain by a pale-yellowish sandy loam. This passes at 6 to 12 inches into a yellow loam or sandy clay loam which quickly grades into a yellow sandy clay, and at 18 to 24 inches a mottled red to yellow sandy clay is

encountered. With increasing depth gray mottlings occur, and at 36 inches the material consists of a yellowish-gray clay mottled with red. Small, angular fragments of quartz and binary granite are abundant on the surface. The highly decomposed substratum of kaolin and quartz is not often encountered within the 3-foot section.

As mapped this type is somewhat variable. The surface soil of included areas ranges from coarse sandy loam to loam. The subsoil may be uniformly yellow in color or it may be mottled throughout. Areas having a uniformly yellow subsoil of friable structure would be mapped as the Durham sandy loam if of sufficient size. Some of the Appling sandy loam areas have included spots of Louisa loam, York sandy loam, and Durham sandy loam. Where the decomposed granite lies near the surface the subsoil is high in kaolin, which imparts a very smooth feel and a fluffy structure.

This type is of small extent. Its principal areas are in the southeastern part of the county. It occurs in a series of long, narrow belts, more or less broken, extending from near Zion Hill School in a northeasterly direction, passing into Randolph County about 3 miles north of Cragford.

The areas of this soil lie at low elevations. The surface ranges from gently undulating to gently rolling. The drainage in general is fair, but it is insufficient in some of the low, flat areas and excessive on some of the steeper slopes. Seriously eroded areas, however, are rare, the sandy surface soil favoring the absorption of much of the rain water.

About 70 per cent of the Appling sandy loam is under cultivation. As a cotton soil, this type probably ranks first in the county. Corn does well, but the yields are hardly equal to those obtained on the bottom lands or on the Cecil clay loam. Oats, cowpeas, soy beans, and sorghum do well, but are not extensively grown. The soil is especially well adapted to trucking, but this industry is not developed because of the remoteness of markets. Sweet potatoes and various vegetables grown in small patches do well. Peaches and apples are grown successfully by almost all the farmers for home consumption.

The average yield of cotton is about one-half bale per acre, but where attention is given to crop rotation, the growing of legumes, seed selection, and careful cultivation, yields of 1 bale per acre are common. Corn yields from 10 to 25 bushels per acre, depending upon the methods of farming.

While a few farmers rotate the crops, plow the land deep in the fall, and turn under all available organic matter, the majority give little if any attention to these better methods of farming. In most cases where cotton or corn is grown a 10–2–2 fertilizer is applied.

The selling price of land of this type ranges from $15 to $40 an acre, depending upon location, improvements, and the condition of the soil.

With better methods, this soil is capable of producing much better yields than those now obtained. The low organic-matter content of the soil and its low water-holding capacity should be corrected by growing green-manure crops, by adding barnyard manure, or by growing such crops as cowpeas in rotation with the other crops.

APPLING GRAVELLY LOAM.

Areas in the Appling sandy loam color shown on the soil map with gravel symbols consist of the Appling gravelly loam. The soil of these areas, to a depth of about 6 inches, is a gray to yellowish sandy loam or loam, containing varying quantities of quartz fragments, ranging in size from fine gravel to about 6 inches in diameter. The subsoil generally is a somewhat plastic clay mottled with yellow, red, and gray, but in some places it is a yellow, friable clay to a depth of 3 feet or more, and in others a white, chalky clay with a slight purplish tint. In many cases the highly weathered bedrock formation, which is usually a dark schist or the Hillabee green schist, is encountered at depths of 2 to 3 feet, and outcrops are common. In both surface soil and subsoil quartz particles are more abundant than those of schist.

Small, detached areas of this type are distributed throughout the southwestern quarter of Clay County. It usually occurs at a lower level than the adjoining Louisa soils. The surface is gently rolling to rolling, and on the whole the drainage is good.

General farming is the leading industry on the Appling gravelly loam. About 50 per cent of the type is under cultivation; the remainder is forested with longleaf pine, shortleaf pine, poplar, white oak, post oak, red oak, Spanish oak, black gum, sweet gum, dogwood, crab-apple, plum, and sassafras. The cutting of crossties and logging are of considerable importance.

Cotton is the cash product on this type, and corn is grown as a subsistence crop. Oats are grown for grain and pasturage and as a soiling crop. Cotton yields range from one-fifth to one-half bale per acre. Corn yields 8 to 18 bushels, and oats 8 to 30 bushels.

The value of this land ranges from $10 to $25 an acre, with an average valuation of about $15.

Deeper plowing, the use of legumes in some system of rotation, and the turning under of all organic matter possible instead of burning it are needed on this type. The raising of stock, especially beef cattle, should prove profitable, as there is considerable land suitable only for pasture. The rougher areas should not be cleared, but should be used for pastures and for forestry.

IREDELL LOAM.

The Iredell loam consists of 3 to 6 inches of light-brown to grayish-brown loam, with a high percentage of fine sand, passing into a brownish-yellow loam which at 8 to 14 inches is underlain by a stiff, plastic, yellowish clay, sometimes showing mottlings of red and gray. As the subsoil approaches the highly weathered parent schist, which is usually encountered within the 3-foot section, it becomes a friable, yellow clay, mottled with red and gray. Small, platy schist fragments are encountered to a greater or less extent throughout both soil and subsoil, and where the parent rock lies at a depth less than 18 inches the surface is almost covered with these small fragments of green schist. As mapped, small patches of Iredell clay loam are included with the Iredell loam.

A variation of this type occurs in the vicinity of Hollins, where the bedrock lies at an average depth of more than 3 feet. Few platy fragments are present here, but angular quartz fragments are scattered over the surface. Some areas of the type approach a clay loam in texture.

The principal areas of the Iredell loam occur in the northeastern and southwestern corners of the county and northwest of Millerville. The topography is undulating to gently rolling. Owing to the impervious nature of the surface soil and subsoil, water does not drain off readily, but stands on the surface for long periods after rains, so that some areas are boggy.

This type is not extensive. About 80 per cent of it, however, is under cultivation, the remainder being mainly forested with hickory, longleaf pine, shortleaf pine, blackjack oak, and cedar. Cotton, corn, and oats and other small grains are grown. The yields of all crops are below the average for the county. The best yields are obtained where the land is broken deeply in the fall and where legumes are plowed under. Ditching is necessary in order to grow crops successfully.

The selling price of land of the Iredell loam ranges from $8 to $20 an acre, averaging about $15.

IREDELL STONY LOAM.

Stone symbols are used on the Iredell loam color to indicate Iredell stony loam. This soil in color, structure, and texture of the fine soil material is very much like the Iredell loam, the difference being due to a greater quantity of gravel and stone in the stony loam areas. Flat fragments of green schist and in places angular fragments of quartz are scattered over the surface and disseminated throughout the soil in sufficient quantities to hinder or even preclude cultivation.

The only important area of this soil occurs on Flat Top Mountain, extending southeastward to near Munroes Mill.

The topography varies from undulating in the valley sections, west of Munroes Mill, to very broken in the mountainous regions. Owing to its plastic nature, this soil has poor internal drainage.

General farming, in conjunction with the cutting of crossties and logs and the operation of small sawmills, is the leading occupation of the farmers on this type. Probably not more than 5 per cent of the Iredell stony loam is arable land, and this is confined to the undulating areas. The remainder is too broken or stony for cultivation, and is largely forested with longleaf pine, poplar, white oak, post oak, red oak, Spanish oak, dogwood, and sassafras. A small number of cattle are raised in these untilled areas, and cattle raising could be extended with profit. Reforesting is needed where the timber has been removed.

Cotton, corn, and oats are grown on the Iredell stony loam, but the yields are low. Farming is very difficult on account of the stones and the plastic nature of the soil. The selling price of this land ranges from $1 to $10 an acre.

Because of the nearness of the bedrock to the surface, the stony nature of the soil, and the rough topography, the greater part of this soil should remain in forest and permanent grazing land.

MECKLENBURG CLAY LOAM.

The soil of the Mecklenburg clay loam consists of 6 to 8 inches of red to reddish-brown loam to clay loam. The subsoil is a red, stiff, plastic clay, that becomes more friable with approach to the decomposed parent schist, which usually is encountered within the 3-foot section. In the more poorly drained areas the subsoil is often yellowish brown or ocherous yellow, the latter color being more common in the lower part of the soil section. Both soil and subsoil are absorptive of moisture. With alternate periods of wet and dry weather large cracks develop in the surface.

This type occurs in a number of small areas in the southwestern corner of Clay County, in Shinbone Valley, near Dempsy, east of Coleta, and in the vicinity of Bethlehem Church.

The topography is undulating to gently rolling. The surface drainage is generally fair, but in many places ditching is needed.

General farming is the leading industry on this soil. Probably 85 per cent of the type is under cultivation; the remainder is mainly forested with hickory, white oak, post oak, red oak, Spanish oak, blackjack oak, longleaf pine, shortleaf pine, and cedar.

Cotton is the leading crop. This is one of the best corn soils in the county, the yields being exceeded only by those obtained on the Cecil clay loam and the Congaree soils. Oats produce somewhat

lower yields than on the lighter textured types. Cowpeas thrive, and the growing of this legume is very beneficial to the soil. Peaches, apples, and grapes are grown successfully for family use. Very little attention is given to stock raising, only a few hogs, work animals, and cows being kept on most farms.

Corn yields from 10 to 30 bushels per acre, cotton about one-half bale, and oats from 12 to 40 bushels. In some cases yields of 1 bale per acre of cotton are reported. About 1½ tons of peavine hay per acre is the ordinary yield.

The wide variations in crop yields are due mainly to different methods of farming. The best yields are obtained where cowpeas or other legumes are grown in crop rotations, where organic matter is incorporated with the soil, and where deep fall plowing is practiced and fertilizers are selected according to the needs of the soil.

Land values range from $10 to $30 an acre, with an average of about $20 an acre.

TALLADEGA SLATE LOAM.

The Talladega slate loam consists of a brown, yellowish-brown or reddish-brown silt loam or silty loam, underlain at about 3 to 8 inches by a red clay having a distinctly greasy feel. Large and small flattish fragments of schist or phyllite and angular fragments of quartz are abundant on the surface, and in many places they impart an open structure to the surface soil. The subsoil contains rock fragments, and the partially decomposed schistose rock frequently is encountered within the 3-foot section. The type includes areas of Talladega stony loam and clay loam and of Chandler slate loam and stony loam, too inextensive to be shown satisfactorily on the soil map.

The Talladega slate loam occupies the greater part of the mountainous country in the northern and western parts of the county. The surface in general is very broken and is minutely dissected by streams, but in a few places the ridges are broad and the slopes are smooth. This type is found on the slopes and crests of narrow ridges. The jointed, laminated character of the underlying phyllite allows the water to pass downward readily and find its way into some of the numerous branches or gullies. This gives rise to excessive drainage in all but the smoother parts of the type.

General farming, in connection with lumbering, is the leading occupation in the Talladega slate loam sections of the county. Only a small part of the type is under cultivation, and this is confined to the broader ridges and smoother slopes. The greater part of the type supports a forest growth consisting mainly of longleaf pine and oak, and this land is apparently best suited to forestry and to use as pasture for cattle and other stock.

The principal crops grown on this type are cotton and corn. Cowpeas, oats, soy beans, and Bermuda grass do well. Garden vegetables of all kinds common to the region are grown for home use. Peaches and strawberries are grown on a small scale by a few farmers, and the yields obtained indicate that the soil is adapted to these fruits.

No attention is given to stock farming other than the raising of a few calves, pigs, and colts to supply the local demand. Very little thought is given to improving the breeds.

Yields of cotton range from one-fourth to one-half bale and of corn from 10 to 17 bushels per acre. The yields vary with the methods of farming and the fertilizer used.

On this type very little attention is given to the adaptation or rotation of crops, the incorporation of organic matter, the growing of legumes or to seed selection. Low-grade commercial fertilizers are used in growing cotton and corn.

Land values range from $3 an acre for the rougher areas to $20 an acre for the better improved areas.

The Talladega slate loam is very deficient in organic matter. This may be supplied in part by plowing under all the stalks and other trash now commonly burned in preparing the land for the plow. In addition green-manure crops should be grown and plowed under. Increasing the organic content of the soil will have a tendency to increase its water-holding power and to make it more mellow. Cowpeas or other legumes should be grown with corn and cotton, or crop rotations in which the legumes are included as separate steps should be used. The best use for the greater part of this land, aside from lumber production, is for raising beef cattle.

CHANDLER GRAVELLY LOAM.

The Chandler gravelly loam consists of a grayish silt loam passing at a depth of about 3 or 4 inches into yellow silty clay loam and this into silty clay containing, frequently, considerable partly weathered material of the parent schist. Blocks of quartz ranging from one-half inch to 3 inches in diameter are abundant throughout the soil section. The subsoil usually has a greasy feel, due to the presence of small particles of partially decomposed phyllite. In some places the underlying phyllite formation is encountered within the 3-foot section, and it rarely lies deeper than 6 feet. The type, as mapped, includes small areas of Talladega gravelly loam, slate loam, and clay loam.

A very pronounced variation in the Chandler gravelly loam is found at the higher elevations where erosion has been severe. If of sufficient extent, this soil would be mapped as the Chandler slate loam.

The surface soil is a grayish silt loam, passing at 3 to 6 inches into a yellow silty clay loam or silty clay, containing a high percentage of small, flat phyllite fragments and some angular quartz fragments. The underlying phyllite formation usually is encountered at 12 to 24 inches.

The Chandler gravelly loam occurs in the mountainous section of the county. The principal area lies in the vicinity of Dowdy Chapel School. Other areas occur east of Campbells Crossroads and west and southwest of Chambers Springs.

On the whole the surface of this type is rough and minutely dissected, with many phyllite outcrops, but a small part of the type is characterized by broad ridges and gentle slopes. The drainage is similar to that of the Talladega slate loam, being excessive in the highly dissected areas and good where the ridges are broad and the slopes gentle.

Lumbering and farming are the principal occupations on this type. Probably less than 3 per cent of it is under cultivation. Almost all the type supports a growth of longleaf pine, oak, and chestnut, and it is probable that forestry, together with grazing, is the best use for the rough, highly broken areas.

The crops, yields, methods of handling the soil, and land values are almost identical with those on the Talladega slate loam.

CONASAUGA GRAVELLY LOAM.

The surface soil of the Conasauga gravelly loam is a light-brown silt loam, passing at about 5 inches into very pale yellow silt loam. This is underlain at about 12 or 15 inches by yellow to reddish-yellow silty clay, which continues to a depth of 3 feet or more. On the surface of much of the type, especially the more rolling areas, small, angular quartz gravel is sufficiently abundant to give the soil a gravelly character. There are included areas of Conasauga silt loam, too small to be mapped separately.

This type covers an area of 3.3 square miles and occurs in a long, narrow belt between Campbells Crossroads and Clairmont Springs, on the lower slopes of the Talladega Mountains. The surface is undulating to gently rolling, and the drainage is good.

Probably 80 per cent of the Conasauga gravelly loam is under cultivation. The remainder supports a growth of longleaf pine, shortleaf pine, white oak, Spanish oak, and post oak.

Cotton is the leading money product, and corn and oats are important crops, grown mainly for feed. Forage crops do well on this soil. Soy beans grow luxuriantly, and cowpeas, Bermuda grass, and lespedeza give good yields. With liming, alfalfa has been grown successfully in recent years, but the roots do not penetrate far into the subsoil where the acidity has not been corrected.

Cotton yields from one-fourth to three-fourths bale per acre, and corn from 10 to 30 bushels, with an average of about 15 bushels per acre.

Some farmers using legumes in crop rotations are obtaining good yields of cotton and corn without the use of commercial nitrogen. Ordinarily a 10–2–2 fertilizer mixture is applied to the land in growing these crops and little or no attention is paid to crop adaptation or rotation. The destructive method of burning organic matter from the land before plowing is being abandoned, and heavier plows are used, which turn such material under.

The selling price of this land ranges from $15 to $45 an acre, with an average of about $25.

DEKALB GRAVELLY LOAM.

The Dekalb gravelly loam consists of about 2 or 3 inches of a grayish, friable loam, passing into yellow or grayish-yellow loam underlain at about 8 inches by a yellow, friable clay loam to clay. At a depth of about 2 to 3 feet a reddish-yellow clay is often encountered. Small, irregular fragments of quartz and quartzite are scattered over the surface, but are less plentiful in the subsoil. As this type approaches the Rough stony land the quartzite rock usually is encountered within the 3-foot section, and the surface is almost completely covered with flat fragments of quartzite, about 1 to 6 inches in diameter. There are some included patches of Talladega gravelly loam and slate loam, Conasauga gravelly loam, Chandler gravelly loam and slate loam, and Rough stony land, the extent of which does not warrant their separation on the soil map. In places there is considerable colluvial material, brought down from higher lying soils.

This type occupies a long, narrow belt on the lower southeastern slope of the Talladega Mountains, extending from a point 3½ miles northwest of Pyriton in a southwesterly direction, crossing the Talladega County line about 3½ miles southwest of Clairmont Springs. Another belt extends southwest from a point near Littles Mill to the Talladega County line. The part of the slope near the Rough stony land is steep and very broken by gullies, but the remainder of the type is moderately rolling, and for the most part can be cultivated. The drainage is thorough, and is excessive in the steeper areas.

There is a rather large total area of this type, but it is of no great importance, as much of it is too steep for satisfactory cultivation. About one-fourth of the type is under cultivation and the remainder is used for forestry and grazing. Cotton is the principal crop. Corn, oats, and cowpeas are grown for feed. Peaches and apples are reported to do well, but are not grown on a commercial scale.

Where the slope is not too steep yields of one-third to one-half bale of cotton per acre are obtained. Corn yields from 12 to 18 bushels per acre.

Very little attention is paid to crop adaptation or rotation. The usual 10–2–2 fertilizer mixture is used for cotton and corn.

Land values on this type are almost the same as on the Talladega slate loam.

The more extensive growing of cowpeas and other legumes would materially improve this soil. Many of the hillsides are subject to gullying, and it is only by growing soil-binding crops, terracing, and ditching that the soil can be kept in place. It would seem that the raising of beef cattle and possibly sheep could be carried on more profitably than the present type of agriculture, as the soil, even where the surface is rough, affords valuable pasturage.

CONGAREE SILT LOAM.

The surface soil of the Congaree silt loam consists of a brown to dark-brown silt loam, about 8 to 14 inches deep. Under normal moisture conditions the soil is friable and loamy. The subsoil is an olive-green, drab or bluish silty clay loam, which is often mottled with yellow and sometimes with red. The upper part is high in silt, and in many cases might be classed as a heavy silt loam. The clay content, however, increases with depth, and at about 2 feet the material becomes a silty clay, which continues to a depth of 36 inches or more.

Areas of the Congaree sandy loam, fine sandy loam, and loam, and also of the Toxaway silt loam, too small to be mapped separately, are included with this type. The Toxaway silt loam spots are very poorly drained and have a dark color, due to partial decomposition of the organic matter in the presence of water. The soil consists of a dark-brown to black silt loam, underlain at about 14 inches by a bluish-gray or drab, compact silty clay loam.

The Congaree silt loam is the most extensive bottom soil of the county, and is a type of considerable importance. It is confined to the flood plains of streams. The principal areas lie along the larger streams. The drainage is not sufficient, and ditching is generally necessary.

About 80 per cent of the Congaree silt loam is under cultivation. The remainder is largely in swamps and forest, consisting of sweet gum, black gum, maple, loblolly pine, bay, holly, alder, poplar, dogwood, azalea, and willow. The type is especially adapted to corn, and this is the most important crop grown. Oats and cowpeas do well on this soil, but are not extensively grown. Bermuda grass and lespedeza furnish excellent pasturage. Corn yields average about 30

bushels to the acre, ranging from about 20 to 75 bushels. In many fields corn has been grown continuously for a long period of years without fertilizers and without apparent diminution of the yields. The sediments deposited by flood waters tend to maintain the productiveness of the soil, especially where the deposits are heavy and are laid down annually. While the use of fertilizers has not been found necessary, rotating corn with cowpeas and oats is beneficial. Where this land has been drained by ditching the yields of corn have been increased.

This type usually is disposed of in connection with other soils and can not be given a separate value.

WEHADKEE SILT LOAM.

The areas of the Wehadkee silt loam, a type of small extent and little importance, are indicated on the soil map by inclusion symbols in areas shown in the Congaree silt loam color. The surface soil consists of about 6 to 10 inches of a light-gray or faint yellowish gray silt loam, underlain by a compact silt loam which passes at about 15 inches into a silty clay loam of mottled gray, brown, and yellow color. At a depth of about 3 feet a silty clay is encountered. In places lenses or layers of sand and gravel occur within the 3-foot section. The soil and subsoil contain some mica and kaolin, which give the material a greasy, fluffy feel and a loose structure.

This soil has a total area of a little more than 1 square mile. It occurs mainly in the southeastern part of the county in the flood plains of streams and is closely associated with the Appling sandy loam. The largest area lies along Shultz Creek.

The Wehadkee silt loam is very poorly drained, and is subject to frequent overflows, but where artificial drainage has been established fair yields of corn are obtained. It is very probable that Bermuda grass and lespedeza as pasture crops would do well. Uncleared areas support a good hardwood timber growth, and the wild grasses provide fair pasturage.

ALTAVISTA LOAM.

Small areas of the Altavista loam are indicated on the soil map by inclusion symbol in areas shown in the Congaree silt loam color. The surface soil consists of a gray to brownish-gray loam about 6 to 10 inches deep. The subsoil is a yellow or mottled yellow and gray loam, grading at 12 to 20 inches into mottled red and yellow silty clay loam, which at about 30 inches passes into pale-yellow clay mottled with gray and red. Small patches of Altavista sandy loam and silt loam are included in the areas of this soil.

The Altavista loam, covering a total area of 2.6 square miles, occupies low, level terraces along all the creeks in the Piedmont

section of the county. It lies 5 to 20 feet above the Congaree soils of the first bottoms. The drainage is not well developed, and ditching has been found beneficial.

Probably 90 per cent of this soil has been placed under cultivation. Both cotton and corn are grown. Excellent yields of Irish and sweet potatoes, cabbage, tomatoes, and strawberries are obtained, but these crops are not grown on a commercial basis. Oats, rye, and wheat produce good yields, and Bermuda grass and lespedeza make good pasturage. Cotton yields average about one-half bale to the acre, and corn yields about 20 bushels. A 10–2–2 fertilizer mixture is commonly used in growing these crops.

The Altavista loam could be improved by ditching or tiling the low, poorly drained areas. It is easily built up by growing legumes in some system of crop rotation and by turning under green manuring crops.

ROUGH STONY LAND.

Rough stony land comprises areas too steep and stony for crop production, and suitable only for forestry and grazing. The soil, where the underlying quartzite lies 2 feet or more beneath the surface, is a gray sandy loam to loam, passing at 2 to 5 inches into a yellowish-gray or pale-yellow loam which overlies a yellow or reddish-yellow, friable sandy clay. Both soil and subsoil contain an abundance of quartzite fragments.

Rough stony land is confined to the Talladega Mountains, and is the result of the existence of a bed of quartzite, which is very resistant to weathering.

On the crests of the ridges the principal tree growth is blackjack oak, with longleaf and shortleaf pine on the slopes.

SUMMARY.

Clay County is in the east-central part of Alabama and has an area of 602 square miles, or 385,280 acres.

The county lies principally within the Piedmont Plateau physiographic province, with a narrow belt in the western part belonging to the Appalachian Mountain province. The topography is undulating to mountainous, and consists largely of parallel ridges and valleys, with broad rolling areas, extending in a northeast-southwest direction.

Clay County lies within the drainage basin of the Coosa and Tallapoosa Rivers. There are no large streams, but all parts of the county are reached by drainage ways.

The county was formed from Randolph and Talladega Counties in 1866. The greater part of the population consists of descendants of the early Anglo-Saxon settlers. The total population is reported in

the 1910 census as 21,006. Ashland, the county seat, has a population of 1,062 and Lineville a population of 1,053.

The railroad transportation facilities are inadequate. Public roads extend into all parts of the county, and the more important highways are kept in fair condition.

The climate is characterized by long summers and short, mild winters. The rainfall is generally well distributed throughout the year. The mean annual temperature is reported at Goodwater, in Coosa County, as about 63° F., and the mean annual precipitation as about 52 inches. There is a normal growing season of 234 days.

Cotton is the money crop of the county, although a larger acreage is devoted to corn, which is grown for use on the farm, chiefly as feed for the work stock. Other crops of some importance are oats, cowpeas, sweet potatoes, and Irish potatoes, grown mainly for home use. Wheat, rye, sorghum, bur and crimson clover, lespedeza, alfalfa, tobacco, onions, peanuts, and sugar cane are produced to a small extent. Peaches, apples, grapes, and some pears are grown on all the upland soils, mainly for home use.

Stock raising and dairying offer excellent opportunities. There are a large number of hogs and beef and dairy cattle, of a fair grade of stock, kept largely to supply the home demand for meat and dairy products. The raising of stock for market receives some attention.

Crops are grown without regard to their soil adaptation, as a rule, and no systematic crop rotations are followed. Increasing attention, however, is being given to improved methods of farming.

The 1910 census reports 3,459 farms in Clay County, of an average size of about 74 acres, of which nearly 32 acres is improved. About 52 per cent of the farms are operated by owners, and the remainder by tenants, who rent mainly on the share basis.

The 1910 census reports the average value of land as $8.30 an acre. The best land at the present time sells for $100 or more an acre.

Farm labor is plentiful. The laborers are paid $10 to $15 a month or 75 cents to $1 a day.

Twenty-two types of soil, exclusive of Rough stony land, are recognized in Clay County. About 96 per cent of the soil is residual in origin, about 3 per cent alluvial, and about 1 per cent colluvial. The loam and stony loam types of soil predominate. The residual, or upland, soils are classed with the Talladega, Chandler, Conasauga, and Dekalb series, belonging to the Appalachian province, and the Louisa, Cecil, Appling, Iredell, and Mecklenburg series, belonging to the Piedmont Plateau province. The Dekalb soil is colluvial. The bottom-land, alluvial soils are classed with the Congaree, Wehadkee, and Altavista series.

The Louisa series is the most extensive in the county. The loam, the predominating soil of the Piedmont section, is used for general

farming, to which it is well adapted. The gravelly sandy loam, stony loam, gravelly loam, and slate loam, where the surface is not too broken or stony, are used successfully for general farming. These soils in places require terracing, contour plowing, and the use of soil-binding crops to prevent washing. The Louisa clay loam is best suited to general farming, but crop yields are lower than on the loam.

The Cecil clay loam is an extensive soil and the best general-purpose type in the county. The loam is inextensive, but almost all the type is devoted to general farming. The stony loam, where the slopes are sufficiently smooth and the rocks are not too numerous, is well suited to general farming. Almost all the Cecil sandy loam is used for general farming, but it is susceptible to erosion, and crop yields are somewhat lower than the average for the county.

The Appling sandy loam and gravelly loam are best suited to general farming. The sandy loam is the best cotton soil of the county.

The Iredell loam, a type of small extent, is best suited to general farming, where the topography and the depth to the underlying rock will permit. The stony loam is largely unarable.

The Mecklenburg clay loam is largely under cultivation. It is used for general farming, and is well adapted to this purpose.

The Talladega slate loam and the Chandler gravelly loam occur in the rough, mountainous sections, and only the gentle slopes and broader ridges are under cultivation. These soils are used almost exclusively, where cultivable, for general farming, to which they are well suited. They are very much in need of organic matter, and the growing of soil-binding crops is necessary to prevent washing.

The Conasauga gravelly loam occupies undulating to gently rolling areas and ranks among the better agricultural soils of the county. It is used for general farming, and is well suited to this purpose.

The Dekalb gravelly loam is a colluvial soil. Where the surface is not too broken or steep, this type is used for general farming.

The Congaree silt loam, an alluvial type, developed in the stream flood plains, is one of the most productive corn soils of the county. The Wehadkee silt loam, also a first-bottom soil, has been made to produce fair crops of corn where drained.

The Altavista loam is a terrace soil. It is well adapted to general farming and trucking.

Rough stony land occupies ridges underlain by the Talladega quartzite, to which rock it owes its origin. The surface is too rough and rocky for agricultural use other than grazing or forestry.

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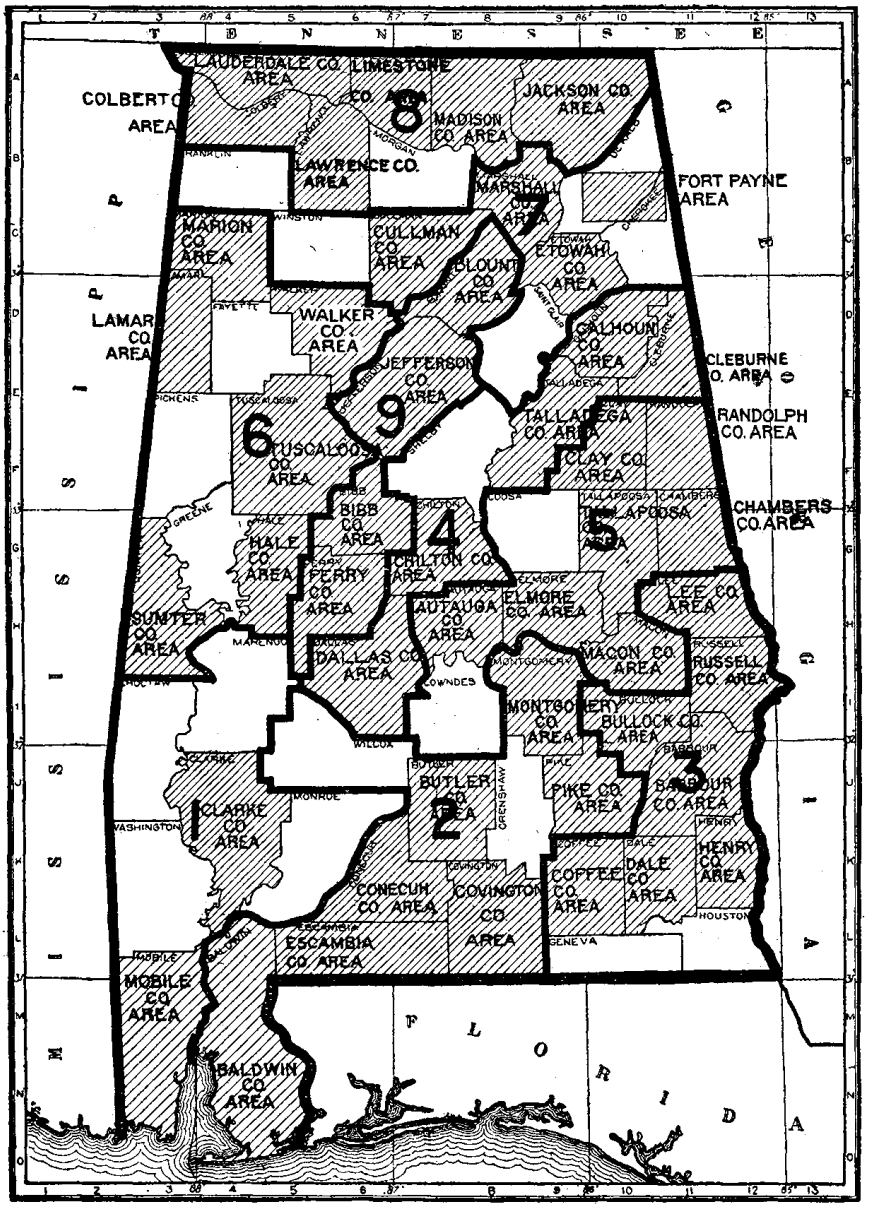

Areas surveyed in Alabama.

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