

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.

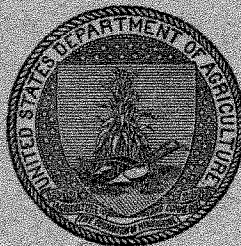
SOIL SURVEY OF ST. CLAIR COUNTY,
ALABAMA.

BY

R. T. AVON BURKE, OF THE U. S. DEPARTMENT OF AGRICULTURE,
IN CHARGE, AND N. ERIC BELL, OF THE ALABAMA DE-
PARTMENT OF AGRICULTURE AND INDUSTRIES.

W. EDWARD HEARN, INSPECTOR, SOUTHERN DIVISION.

[Advance Sheets—Field Operations of the Bureau of Soils, 1917.]



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SOIL SURVEY OF ST. CLAIR COUNTY, ALABAMA.

By R. T. AVON BURKE, of the U. S. Department of Agriculture, In Charge, and N. ERIC BELL, of the Alabama Department of Agriculture and Industries.—Area Inspected by W. EDWARD HEARN.

DESCRIPTION OF THE AREA.

St. Clair County is situated in the north-central part of the State of Alabama, about 35 miles east of Birmingham. It is an irregular, five-sided area embracing 633 square miles, or 405,120 acres.

The county in general may be described as mountainous. The topographic features consist of narrow ridges and numerous intervening valleys, extending in a northeasterly direction, but only one of the ridges, Backbone Mountain, is continuous throughout the county. It attains an altitude of 1,601 feet above sea level at Bald Rock and decreases to about 1,100 feet at the point where it crosses the south county line. Among the more conspicuous of the other ridges are Blount and Chandler Mountains, which lie in the north and northwestern parts of the county, respectively. Blount Mountain attains an elevation of about 1,200 feet above sea level and Chandler Mountain a maximum of 1,500 feet. All these mountains stand out prominently from the intermediate valleys, rising from 200 to 700 feet above the latter. Mountain ridges of minor importance are Bear, Cahaba, Canoe, and Canoe Creek Mountains, and many other ridges traverse different parts of the county.

On the tops of ridges and mountains there are in places narrow, winding areas that are gently rolling or flat and susceptible of cultivation. One of the largest of these areas is on top of Chandler Mountain. The crest of Blount Mountain is next in importance. The slopes of the mountains are generally steep and rough, and much of this country has little or no agricultural value. A considerable part of the rolling, hilly country can be cultivated.

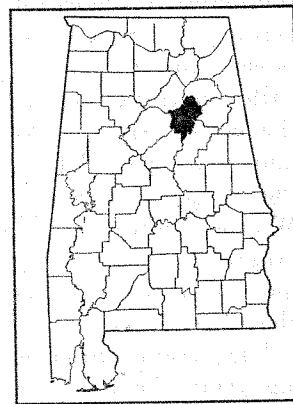


FIG. 1.—Sketch map showing location of the St. Clair County area, Alabama.

The broad valley belts are principally of limestone origin, and vary from broad, level flats to gently rolling areas, or foothills. They constitute the most important agricultural lands in the county.

With the exception of the stream bottoms and some of the flatter upland areas, all of St. Clair County is well drained. The Cahaba River and the Coosa River, of which the latter is the more important, drain fully nine-tenths of its area. The Cahaba River forms the boundary of the county for a short distance in the southwestern part. Its principal tributaries are Little Cahaba River and Black Creek. These streams have developed small but not continuous bottom lands and are actively engaged in deepening their channels. Drainage is well developed in this section and stream branches ramify in all directions, hardly any farm being untouched by some creek or branch. The Coosa River receives the waters of Big and Little Canoe Creeks, which form the northern boundary of the county, and a large part of this territory is drained by them.

The highest elevations are in the northern part of the county, and the lowest in the eastern and southern parts. The extreme range in elevation is from 450 to 1,600 feet. The general slope of the county is east, toward the Coosa Valley, and the general elevation of the valley margins ranges from 400 to 800 feet above sea level. One of the largest areas of low altitude and poor drainage is the section known as the "flatwoods," extending across the northern part of the county and being well developed in the vicinity of Caldwell, Whitney Station, and south of Steele. The elevation of this belt ranges in elevation between 500 and 600 feet above sea level. Where the Coosa River leaves the county the elevation is about 400 feet above sea level.

The streams are generally swift flowing and are gradually deepening their channels. Along some of them water power has been developed to operate grist mills and a few flour mills. The streams are capable of furnishing much more power than is at present used.

In the limestone-valley region there are numerous large springs of clear, cool water, notable among which are those at Springville, Ashville, Easonville, and Cooks Springs.

Lying in the mineral region of the State and adjacent to Jefferson County, which is mineralogically the richest county of the State, St. Clair County has a promise of considerable industrial development. It is known to have rich deposits of coal and iron, and smaller deposits of bauxite, barites, lead, and other minerals. The deposits of coal are known more or less definitely. They occur in two fields, known as the Coosa and Cahaba coal fields, of which the latter is the most important. Mines at Margaret and Parsons have a large output. The coal mines at Coal City and Ragland, in the Coosa field, have been in operation for years.

St. Clair County was formed in 1818. The population in 1910, nearly 100 years later, had increased to 20,715, an average of 32 persons to the mile. Most of the inhabitants are native born, and there are comparatively few negroes. The population is largely concentrated in the valleys. Few people live in the mountain areas, with the possible exception of Blount and Chandler Mountains and the plateaulike tops of some others. The population is all classed as rural, there being no town in the county with over 2,500 inhabitants.

The principal towns with their populations in 1910 are: Pell City, 530; Ragland, 483; Coal City, 685; Springville, 350; and Ashville, 278. Places of more or less importance are Odenville, Branchville, Cooks Springs, Steele, Caldwell, Eden, and Riverside.

The main lines of two railroads traverse the county, giving convenient service to all sections. The Seaboard Air Line Railway extends east and northeast through the county, passing through the stations of Parsons, Odenville, and Coal City. A local extension of the line goes from Coal City to Pell City. A line of the Southern Railway extends in a northeasterly direction through the county, passing the stations of Springville, Caldwell, Whitney, and Steele. The Atlanta & Birmingham Division of the Southern Railway passes through the county in an easterly direction. Eden, Pell City, Seddon, and Riverside are on this line. The Birmingham & Atlantic Railway operates a line from Pell City to Talladega, Ala.

Some good highways have been built through the county, and more are under construction. Grades on all the roads are being reduced where expedient. Chert, which is abundant, is used for road surfacing. The second and third class roads, especially through the mountain region, are fairly good in summer, though poor during wet seasons. Rural mail routes serve most of the county, and telephone lines connect most of the farm houses. Schools and churches are conveniently located.

The markets for the farm products of the county are mainly the local towns. The principal larger markets are Birmingham and Anniston, Ala., Atlanta, Ga., and Chattanooga, Tenn.

CLIMATE.

The climate of St. Clair County is mildly temperate, healthful, and well suited to agriculture.

The winters are usually mild, and little unpleasant weather is experienced before the first of December. Generally the coldest month is January, the mean temperature being 42.6° F., but more extreme cold may come in February, the lowest temperature on record, -12° F., having occurred in that month.

The summers are generally long. There are some days that are hot and oppressive, but generally the weather is pleasant, the nights being nearly always cool. The highest temperature recorded is 105° F., in both June and July, and the highest mean temperature for any month is 79.6° F., for August. Temperatures on Chandler Mountain and other high mountains are said to average several degrees lower than those of the valleys.

The annual precipitation for the driest year on record (1896) was 34.67 inches and for the wettest year (1900) 71.08 inches. The mean annual precipitation amounts to 52.32 inches. The rainfall is well distributed and ample for the crops grown. Prolonged rains are usually accompanied by east and southeast winds, but showers generally come with southwest and west winds.

The earliest recorded killing frost in the fall occurred October 11 and the latest in the spring, on April 25. The average date of the first killing frost in the fall is October 28 and that of the last in the spring, March 31. This gives an approximate growing season of 211 days, which is ample for the production of a wide range of crops.

With the great differences in topography occurring within the limits of St. Clair County, local differences in climatic conditions may be expected. It is reported by farmers that peaches and early truck crops do especially well on the ridges or mountain tops and are rarely affected there by late spring frosts. Apples, however, which are not so susceptible, are produced in the foothills as well as on the mountain tops, although fruit of finer quality is obtained at the higher altitudes.

St. Clair County has exceptionally good supplies of excellent water. Springs are found in all parts of the county, seeping from the bluffs or bubbling up where fissures occur in the lime rock. Good water can be obtained in wells at depths ranging from 12 to 75 feet.

The following table, compiled from the records of the Weather Bureau station at Ashville, gives the more essential facts concerning the climate:

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

| Month. | Temperature. | | | Precipitation. | | |
|---------------|--------------|-------------------|-------------------|----------------|--|---|
| | Mean. | Absolute maximum. | Absolute minimum. | Mean. | Total amount for the driest year (1896). | Total amount for the wettest year (1900). |
| | ° F. | ° F. | ° F. | Inches. | Inches. | Inches. |
| December..... | 42.9 | 76 | 4 | 4.97 | 1.11 | 3.41 |
| January..... | 42.6 | 80 | 2 | 4.64 | 4.42 | 2.65 |
| February..... | 42.8 | 80 | -12 | 5.33 | 3.78 | 7.40 |
| Winter..... | 42.8 | 80 | -12 | 14.94 | 9.31 | 13.46 |

*Normal monthly, seasonal, and annual temperature and precipitation at
Ashville—Continued.*

| Month. | Temperature. | | | Precipitation. | | |
|----------------|--------------|-------------------|-------------------|----------------|--|---|
| | Mean. | Absolute maximum. | Absolute minimum. | Mean. | Total amount for the driest year (1896). | Total amount for the wettest year (1900). |
| | <i>° F.</i> | <i>° F.</i> | <i>° F.</i> | <i>Inches.</i> | <i>Inches.</i> | <i>Inches.</i> |
| March..... | 54.5 | 89 | 9 | 6.29 | 4.48 | 6.35 |
| April..... | 61.5 | 92 | 26 | 4.76 | 4.21 | 12.56 |
| May..... | 69.7 | 99 | 35 | 4.17 | 2.35 | 2.93 |
| Spring..... | 62.2 | 99 | 9 | 15.19 | 11.04 | 21.84 |
| June..... | 77.5 | 105 | 44 | 4.22 | 3.14 | 11.98 |
| July..... | 78.3 | 105 | 54 | 4.99 | 2.22 | 6.45 |
| August..... | 79.6 | 104 | 54 | 4.00 | 1.20 | 1.44 |
| Summer..... | 78.5 | 105 | 44 | 13.21 | 6.56 | 19.87 |
| September..... | 73.1 | 104 | 34 | 3.68 | 1.89 | 5.35 |
| October..... | 61.3 | 96 | 23 | 2.69 | 1.09 | 6.73 |
| November..... | 51.6 | 89 | 13 | 2.61 | 4.78 | 3.83 |
| Fall..... | 62.0 | 104 | 13 | 8.98 | 7.76 | 15.91 |
| Year..... | 61.3 | 105 | -12 | 52.32 | 34.67 | 71.08 |

AGRICULTURE.

St. Clair County was originally covered with mixed forests of oak, hickory, longleaf and shortleaf pine, chestnut, walnut, and other hardwoods, and fitting the land for cultivation was difficult and slow. Most of the early settlers located in the lowland belts, where the soils are most productive. By the time of the Civil War, the greater part of these lower lying lands had been cleared of their forests and there had been established many prosperous plantations, on which the various subsistence crops and cotton, already the chief cash crop, were produced.

It has taken considerable time for the county to overcome conditions caused by the Civil War, but in the last 40 years, and especially during the last decade, much progress has been made, important factors in this progress being the development of the coal and iron industries and the building of railroads.

Lumbering has removed the greater part of the original forest throughout the county, leaving on uncleared areas a second growth, principally of pine. Most of the lowland regions have been cleared, and these constitute the chief farming sections of the county. Little farming is done on the hillsides or ridge-tops, and that is for the most part patch farming, except on Chandler and Blount Mountains, where there are large tracts of excellent farming land.

Some idea of past and present agricultural conditions may be obtained from the census reports. In 1880 there were 1,674 farms in the county, representing 59.8 per cent of its total area. These farms had an average size of 147.4 acres, of which 39.3 acres was improved land. In 1890 the total number of farms was 1,847, and they comprised 59.1 per cent of the total area of the county. Their average size was 132 acres, of which 51 acres was improved. In 1900 the number of farms had increased to 2,654, representing 59.1 per cent of the total area of the county. These farms had an average size of 92 acres, of which 35 acres was improved. For 1910 the census reports 2,611 farms in the county, representing 55.1 per cent of its total area. The average size was 87.2 acres, of which 34.5 acres was improved.

These statistics show a material increase in the agricultural development of the county, despite the fact that the total area in farms has remained about stationary. The number of farms has steadily increased while their size has steadily decreased, and the percentage of improved farm land has increased from 26.6 in 1880 to 39.5 in 1910. The average size of farms, however, does not represent the average land holding, as the census reports each tenancy as a farm.

The agriculture of St. Clair County at the present time might be described as general farming. There has been little or no development of special industries. The principal crops, named in the order of importance, are corn, cotton, hay (cowpeas, sorghum, mixed cowpeas and sorghum, or grain cut green), and oats. Sorghum (for sirup), velvet beans, sweet potatoes, Irish potatoes, peanuts, vegetables, and fruit are produced to some extent.

Corn is the most important crop. Its acreage shows little change from 1879 to 1909. The greatest area in corn was recorded in 1899, when the crop occupied 31,944 acres. In 1909 the area planted fell to 25,088 acres, but, according to the report of the Bureau of Crop Estimates, it increased to 40,000 acres in 1917. Corn is the chief subsistence crop of the county. In 1917 some was shipped out of the county, but this is exceptional, for as a general rule not enough is produced to meet the local demand. Most of the corn grown is of the white dent type, but there is some Tennessee Red Cob. Productive strains are usually obtained by field selection.

Cotton is the chief cash crop of the county. Its acreage steadily increased from 14,735 acres in 1879 to 22,943 acres in 1899, but fell to 20,617 acres in 1909 and was further reduced to 15,000 acres in 1917. The boll weevil, however, has become active, 1917 being considered the second year for this pest.

The greater part of the cotton grown is unnamed and represents a mixture of many varieties, both big and small boll. In the past many new varieties have been introduced, among which are the Kings Improved, Triumph, Simpkins Improved, and Brown.

The third crop of importance is hay and coarse forage. Little hay is sold from the farms. The crop represents a wide diversity of plants, consisting of grasses, sorghums, soy beans, cowpeas, or oats cut green. The acreage in hay has only been developed to an appreciable extent during the last decade. In 1889 only 167 acres were devoted to growing tame hay, and the area increased to only 887 acres in 1909, but a total of 6,600 acres is reported for 1917. In early times the farmers depended largely on corn fodder as roughage for stock, and this is still used extensively. For pasturage dependence is placed mainly on broom sedge, crab grass, and Japan clover. Some farmers have grown red and white clover, timothy, redtop, and Johnson grass experimentally. In 1917 2,000 acres of velvet beans were grown, chiefly for pasturing down by live stock. The crop did not mature seed as well as was expected, but it is not unlikely that a type better adapted to the climate of this section will be developed.

Oats have changed little in acreage in the last 40 years. In 1879 4,603 acres were seeded to this crop, in 1909 3,759 acres, and in 1917 3,500 acres. The crop is generally grown for grain, but a small proportion is cut green for hay. Most of the oats are fall sown. The crop is used chiefly for feeding stock and displaces corn to some extent in stock rations.

Sorghum for sirup was grown on 365 acres in 1899, and on 358 acres in 1909. In 1917, under the stimulus of sugar shortage, the area was increased to 3,400 acres. The sirup is consumed mainly on the farms, but a large quantity is shipped to Birmingham and other markets.

The area in sweet potatoes in 1879 was 226 acres, and in 1909, 542 acres. The estimate of the Bureau of Crop Estimates for 1917 shows a total of 1,000 acres.

Wheat was formerly one of the most important crops of the county. In 1879 it was grown on 9,841 acres, in 1889 on 1,495 acres, in 1899 on 6,023 acres, and in 1909 on only 96 acres. The acreage in 1917 is not given by the Bureau of Crop Estimates, but it must have been over 1,000 acres. Most of the crop is sold to local mills or exchanged for flour. It is said to be of unusually good quality, especially when grown on hillside soils.

Live-stock raising is of minor importance in the county. According to the census, there were 8,873 head of cattle, 1,463 horses, 2,361 mules, and 8,310 hogs in the county in 1910. The cattle, which are principally Jersey and Holstein grades, are used chiefly for home dairy purposes. There are a few well-developed dairy farms in the county, mainly in the vicinity of Pell City. The milk is sold locally or the cream separated and shipped to more distant markets. Hogs are raised generally for home consumption, but owing to the present high prices many are sold in the local markets.

A marked change is taking place in the agriculture of St. Clair County. There is a decided tendency to break away from the exclusive production of cotton and corn. Subsistence crops are being grown more generally and marketed in the less bulky form of beef, pork, or dairy products. Large home gardens are more common, the excess products being hauled to canneries or sold in the local markets.

Many small orchards have been set out, and these promise success. Most of the fruit is produced in the valleys or on the immediate foothills.

Although nearly all farmers recognize some difference in the adaptation of the soils to different crops, little attention is given to this in actual practice. The farmers realize that peaches, apples, and early truck crops do best on the mountain and ridge tops, and particularly on the Dekalb and Hanceville fine sandy loams. Most of the well-drained bottom soils, such as the Huntington silt loam and the Pope silt loam and fine sandy loam, are used for corn, while most of the cotton, small grain, and forage is produced in the lowland or on the foothill soils. Some relation between the quality of cotton and grain and certain soils has also been recognized. Cotton produces a better quality of lint on the lighter colored or sandy soils than on other types. On some of the heavy and darker colored soils cotton is apt to stain, especially in wet weather, although the difference in yields frequently compensates for the lower grade of the lint. The best quality of wheat or oats is produced on the foothill soils, particularly those types derived from limestone.

The methods of handling the crops in St. Clair County differ little from the methods followed generally in the mountain division of the cotton belt. On the more level areas oats and wheat are cut with a binder, but in the more rolling country they are harvested with the cradle, shocked in the field, and subsequently thrashed. Part of the oat crop is cut green for hay.

The farm improvements and equipment vary with the location and character of farming lands. The houses include some large and costly buildings, but most of them are substantial 1 or 2 story structures, surrounded by the necessary outbuildings, such as barns and corncribs. In the rougher and steeper country the farm implements are poor, but in the valleys and on the better hill farms they include more improved implements and machinery, among which are modern 1 and 2 horse turnplows, sidehill plows, and disk plows. Various kinds of 1-horse cultivators, as well as riding cultivators (equipped with either shovels or disks), mowers, hay rakes, binders, manure spreaders, and stalk cutters are used. Thrashing outfits are generally operated from farm to farm in season.

No definite system of rotation is followed. Corn is grown almost to the exclusion of all other crops on the bottom lands, and in

some cases as many as 25 successive crops have been produced in the same field. There has been the same continuous production of cotton in places in the uplands. Some farmers, however, alternate one or more crops of corn with about the same number of crops of cotton. Where the yields have become unprofitable, especially in the foothill areas, much of the land has been thrown out of cultivation and allowed to reforest, new land being cleared for cultivation. In the valley lands, however, the more progressive farmers make some effort to conserve the productiveness of the soils. Many farmers sow oats, wheat, or rye after corn or between cotton rows, as these grains make excellent cover crops, protecting the soil from surface wash during the winter. They also afford winter pasturage for live stock, and may either be turned under for green manure or allowed to mature for their grain. They may be followed by cowpeas.

St. Clair County depends mainly on commercial fertilizers to maintain the productiveness of the soil, the annual expenditure having increased from \$18,740 in 1879 to \$40,238 in 1909. In the latter year 1,757 farms reported the use of fertilizers, so that the per farm expenditure is \$22.90. The shortage of potash and the high cost of all fertilizers has materially decreased the use in the last few years. In normal times most of the fertilizer used is a mixture containing 10 per cent of phosphoric acid, 2 per cent of nitrogen, and 2 per cent of potash. Since the shortage in potash the mixtures have contained 10 per cent of phosphoric acid, 2 per cent of nitrogen, and no potash. Besides the mixed fertilizers considerable cottonseed meal, tankage, and nitrate of soda are used. The quantity of commercial fertilizers employed on different farms varies widely, as most of it is used on cotton. The applications vary from 100 to 500 pounds per acre. When available, stable manure and lot manure are used generally for corn grown in the uplands. Some farmers use tankage or cottonseed meal on corn, but the greater part of the crop is produced in the rich bottoms where no fertilizer is used. Besides commercial fertilizers and stable manure, many farmers make use of green-manure crops or grow leguminous forage, such as cowpeas, velvet beans, peanuts, and soy beans, between the rows of corn or cotton, graze cattle or hogs in the fields, and turn under the residue to enrich the soil. This is said to be one of the best ways to increase the productiveness of the soils in the absence of sufficient live stock to produce large supplies of manure.

Most of the laborers employed on the farms are native-born Americans, both white and colored, the former predominating. Labor is generally scarce and hard to obtain, but the laborers are usually efficient. According to the census, \$33,169 was spent for labor in 1909, representing an expenditure of about \$55.28 for each

of the 600 farms reporting the use of hired labor. Most of the farm work is done by the farmer and his family. When hands are employed by the month the wage, with board, ranges from \$15 to \$25, while day laborers receive \$1 to \$1.25 a day. Cotton picking is usually done for prices that range from 50 cents to \$1 a hundred pounds.

The farms of the county range in size from 40 to 1,000 acres or more, with the average size 87.2 acres. The average holding, however, is considerably larger than this, the census tabulating each tenancy as a farm. Two industrial corporations own large tracts of land in St. Clair County, and there is little real development in the territory owned by them. Where such land is sold the mineral rights are generally reserved.

According to the 1910 census, 51.9 per cent of the farms of St. Clair County are operated by owners, 47.9 per cent by tenants, and 0.2 per cent by managers. Since 1880 the census shows a considerable decrease in the percentage of farms operated by owners and a great increase in the percentage of tenant-operated farms. In 1880 the percentage in the latter class was 22.2. Land is leased both for a share of the crops and for cash, the former plan predominating. Under the share system, when the tenant supplies work stock, implements, the labor, and hauls the fertilizer, the landlord usually receives one-fourth of the cotton and one-third of the corn. When the landlord supplies work stock and tools, and seed, he receives half of all the crops produced and the tenant pays one-half the cost of fertilizers out of his returns. When land is rented on a cash basis, the rate ranges from \$1 to \$5 an acre, depending on the location, improvements, and other factors.

Land values vary considerably, ranging from \$4 or \$5 to \$75 an acre. Where mining corporations sell land, the mineral rights are generally excepted from the transfer of title.

SOILS.¹

St. Clair County lies in the extreme southern division of the Appalachian Mountain region. The rocks of the county show great diversity and range in age, from the Cambrian to Carboniferous.

¹ St. Clair County adjoins Jefferson County on the west, and the soils lying along the boundary between the two counties join only in a few places, owing to the fact that since the time when Jefferson County was surveyed the classification of the soils has been revised and extended. St. Clair County adjoins Blount County on the north, and the same lack of conformity exists here and for the same reason. For example, the Dekalb fine sandy loam, Hanceville fine sandy loam, Hanceville gravelly loam, Hanceville stony loam, Dekalb stony loam, and Rough stony land mapped in St. Clair County joins a continuous area mapped as Dekalb sandy loam in Blount County. This shows the greater detail possible in the later survey as the result of a further knowledge of the soils of this part of the country.

They consist of a great variety of sandstones, shales, and limestones. Sandstones form practically all of the mountain ranges, Stoval Mountain being a prominent example, while the shales and limestones are developed for the most part in the lowland belts lying between the mountain ranges. The limestones vary from an almost pure limestone, more or less magnesian, to a highly cherty formation. All the limestone is confined to the lowland belts.

The soils of the county, except those of alluvial origin, have been derived from the weathered products of the rocks, and are nearly as varied as the rocks which underlie them. They are, therefore, of residual origin and diverse characteristics. The alluvial soils represent material washed from the uplands and laid down by the streams on old terraces or present flood plains.

The various soils of the county are grouped together into series, whose origin, color, structure, and drainage conditions are similar. The upland, or residual, soils are classed in the Dekalb, Hanceville, Clarksville, Decatur, Hagerstown, Frederick, Upshur, Colbert, Montevallo, and Guthrie series; the second-bottom soils in the Elk and Holston series; and the first-bottom soils in the Huntington, Pope, and Holly series.

The types included in the Dekalb series have gray or yellowish surface soils and pale-yellow, friable subsoils. They are derived from various sandstone and shale formations, and occur on the mountain ranges.

The Hanceville series includes types with grayish-brown or red soils and red, friable subsoils. These types are derived from sandstone and shales, and are closely associated with the Dekalb soils.

The types in the Clarksville series are characterized by gray to yellowish surface soils and pale-yellow, friable subsoils. They are derived from cherty limestone, and many fragments representing the impurities in this rock are scattered upon the surface.

The types in the Decatur soils are characterized by dark-red or reddish-brown surface soils and deep-red, rather heavy subsoils. They are derived from pure limestone—in places the Tusculumbia limestone of the sub-Carboniferous period. The rocks are usually massive in structure, blue or gray in color, and generally chert free.

The Hagerstown series includes those types with brown or yellowish-brown surface soils and reddish-yellow or reddish-brown, friable subsoils, with an apparent derivation from the same kind of rock as the Decatur soils.

The Frederick soils are intermediate in subsoil color between the yellow of the Clarksville and the red of Decatur. The surface soils are gray or brownish yellow. The subsoils begin as a reddish-yellow

or salmon-colored, friable clay loam and at about 10 to 18 inches grade into a yellowish-red or red, rather heavy but friable clay. These types are derived from cherty limestone, and usually carry fragments of this rock on the surface.

The types in the Upshur series have reddish-brown or Indian-red surface soils and dark-red or Indian-red, friable subsoils. They are derived from red or purplish sandstone.

The Colbert series includes types with gray or yellowish-gray surface soils and yellow, heavy, plastic clay subsoils. These soils are derived from limestone and calcareous shale.

The types classified in the Montevallo series are characterized by gray to light-brown surface soils and heavy, rather plastic subsoils of variegated color, the latter being due to the red and gray and yellow colors of the parent shale, and not to weathering of the soil material. The Montevallo soils are derived from what is locally known as the Montevallo formation, which consists of shale and fine-grained sandstone.

The Guthrie series includes types with gray to whitish surface soils and mottled gray and yellow, compact and hard silty clay subsoils. These soils are developed in depressions, in areas of the Clarksville, Hagerstown, and Decatur soils, and are naturally poorly drained.

The types included in the Elk series have brown surface soils and brownish-yellow or light-brown, friable subsoils. The members of this series are developed on terraces or second bottoms and represent stream-deposited material from the limestone areas, with some admixture of Appalachian material.

The Holston series includes types with brown or grayish-brown surface soils and brownish-yellow or light-brown, friable subsoils. These soils are developed on terraces or second bottoms of streams and represent material washed from the Appalachian Mountains.

The types grouped in the Huntington series are characterized by brown surface soils and light-brown subsoils. They are developed in the first bottoms of streams whose deposits consist of wash from limestone areas.

The Holly series, also a first-bottom series, differs from the Huntington in that the surface soils are light gray to whitish and the subsoils are mottled yellow and gray. These soils are poorly drained.

The Pope series includes types with brown surface soils and light-brown, friable subsoils. It is developed in the first bottoms of streams that drain areas of Dekalb and Hanceville soils.

The following table gives the names and the actual and relative extent of the several soils existing in St. Clair County:

Areas of different soils.

| Soil. | Acres. | Per cent. | Soil. | Acres. | Per cent. |
|------------------------------------|--------|-----------|----------------------------------|---------|-----------|
| Hanceville stony loam..... | 55,040 | 13.6 | Hanceville silt loam..... | 5,824 | 2.3 |
| Rough stony land..... | 49,664 | 12.3 | Steep phase..... | 3,520 | |
| Colbert silty clay loam..... | 33,280 | 8.2 | Holly silt loam..... | 7,552 | 1.9 |
| Montevallo gravelly silt loam..... | 28,224 | 6.9 | Pope fine sandy loam..... | 6,720 | 1.7 |
| Frederick stony loam..... | 27,264 | 6.7 | Dekalb silt loam..... | 4,032 | 0.9 |
| Clarksville stony loam..... | 22,656 | 5.6 | Colbert silt loam..... | 3,648 | 0.9 |
| Frederick gravelly loam..... | 18,624 | 4.6 | Clarksville silt loam..... | 3,136 | 0.8 |
| Dekalb stony loam..... | 17,024 | 4.2 | Pope silt loam..... | 2,880 | 0.7 |
| Hanceville gravelly loam..... | 14,272 | 4.0 | Elk fine sandy loam..... | 2,816 | 0.7 |
| Steep phase..... | 2,176 | | Colbert loam..... | 2,560 | 0.6 |
| Decatur loam..... | 16,320 | 4.0 | Upshur stony loam..... | 2,048 | 0.5 |
| Clarksville gravelly loam..... | 14,080 | 3.5 | Frederick loam..... | 1,472 | 0.4 |
| Hagerstown loam..... | 13,120 | 3.2 | Guthrie silt loam..... | 1,408 | 0.4 |
| Huntington silt loam..... | 12,992 | 3.2 | Clarksville fine sandy loam..... | 1,344 | 0.4 |
| Dekalb fine sandy loam..... | 11,968 | 3.0 | Holston silt loam..... | 576 | 0.1 |
| Hanceville fine sandy loam..... | 9,536 | 2.4 | | | |
| Dekalb shale loam..... | 9,344 | 2.3 | Total..... | 405,120 | |

CLARKSVILLE STONY LOAM.

The soil of the Clarksville stony loam consists of a light-gray or whitish loam, 6 to 12 inches deep. The subsoil is a pale-yellow silty or fine sandy clay which rarely exceeds a depth of 20 inches, where it grades into broken limestone or chert. Over the surface and throughout the soil there is an abundance of angular chert gravel and stone of a grayish color or stained with yellow and brown. The gravel and stone makes up 30 to 50 per cent of the surface material, and the proportion becomes even greater with depth. In some places the soil may be sandy, while in others it may be quite silty. Local outcrops of limestone and cherty limestone or chert are not infrequent.

The Clarksville stony loam is one of the most extensive soils of the county. It is well developed along Piney Ridge and to the southeast of Coal City, northeast of Pell City, along Stoval Mountain, on the west county line south of Cahaba Mountain, and southwest of Brompton. Small detached areas occur throughout the lowland regions of the county.

The type occupies the lower slopes of the mountains and ridges, or the hills and ridges in the limestone valleys, and has a steeply rolling or broken topography. All the type is well drained, and in

places drainage is excessive. Little or none of it is under cultivation, and most of it supports a mixed growth of oak, hickory, and pine. Where the forest is thin the type affords scanty pasturage. In the more favorable places it could be used for apple growing, but most of that now cleared should be reforested. The soil is open and porous and does not compact. It can be worked immediately after rains, but it has been subjected to considerable wash and much of it is badly gullied and eroded.

CLARKSVILLE GRAVELLY LOAM.

The Clarksville gravelly loam consists of gray or yellowish-gray loam, 5 to 10 inches deep, underlain by pale-yellow, friable clay which rarely exceeds a depth of 24 inches, where it rests upon cherty limestone or chert. Over the surface and throughout the 3-foot section there is from 20 to 50 per cent of angular chert gravel, whitish gray or stained with yellow and brown. There is some variation in the texture of the soil, which may range in patches from gravelly sandy loam to gravelly silt loam. The type also includes patches of soil comparatively free from gravel which would be separated as Clarksville silt loam or loam were the areas of sufficient extent. There are also included small areas of Clarksville stony loam.

The Clarksville gravelly loam occurs both north and south of Piney Ridge, along Beaver Valley Road, southwest of Pine Forest Church, and on the east and west slopes of Stoval Mountain. It is also well developed west of Odenville and in the vicinity of Goat Hill School, and in smaller areas in the western and southwestern parts of the county.

The type occupies the mountain foothills or isolated ridges and knobs in the lowland belts, and the surface may be hilly, rolling, or steeply sloping. It is generally well drained, and some of the steeper slopes have excessive drainage, and are much furrowed and gullied by erosion.

This is not an important type, as only about 30 per cent of it is under cultivation. The remainder supports a mixed growth of oak and other hardwoods in addition to occasional pine. The type is used for cotton, corn, oats, wheat, forage crops, and fruit. Cotton and corn occupy most of the acreage planted. Corn yields 15 to 25 bushels per acre; cotton, one-third to one-half bale; oats, 20 to 30 bushels; wheat, 10 to 15 bushels; and cowpeas, from one-half to 1 ton per acre. Apples and garden vegetables, grown for home use, do well. The soil is much easier to work than the Clarksville stony loam, as the gravel is much smaller and stones are few. It responds well to fertilization, and good yields of cotton are obtained with acreage applications of 100 to 400 pounds of a 10-2-2 fertilizer.

The Clarksville gravelly loam is deficient in organic matter and is inclined to be droughty. The incorporation of organic matter in the form of stable manure or by turning under green-manure crops would increase or at least maintain the productiveness.

Land of this type is held at prices ranging from \$10 to \$25 an acre, depending on the improvements, location, and other factors.

CLARKSVILLE FINE SANDY LOAM.

The soil of the Clarksville fine sandy loam consists of a gray or yellowish-gray fine sandy loam, 5 to 10 inches deep. The subsoil is a yellow or pale-yellow fine sandy clay or friable clay, which usually persists to 3 feet or more.

This type represents Clarksville silt loam or loam over which there has been deposited some colluvial wash from the sandstone formations lying higher up the slopes. It has a very limited distribution. It occurs in the northern part of the county, near Big Canoe Creek, $3\frac{1}{2}$ to 4 miles northeast of Ashville, and along Little Canoe Creek, 3 miles north and northwest of its junction with Big Canoe Creek.

The Clarksville fine sandy loam occupies gently rolling to rolling valley lands and is generally well drained, but it is an inextensive and unimportant type. It is used for the production of cotton, corn, forage crops, and garden truck. Corn and cotton are the principal crops. Corn yields 15 to 30 bushels and cotton one-third to three-fourths bale per acre. Cowpea hay ranges in yield from 1 to $1\frac{1}{2}$ tons per acre, while all kinds of garden vegetables do well. The soil is easy to work, and crops mature early. It would be an excellent type for the production of early truck, but conditions at present would not justify the development of the trucking industry. The soil is deficient in organic matter, and this material must be incorporated if maximum yields of the general farm crops are to be obtained.

Land of this type is held at \$15 to \$30 an acre, depending largely on the location.

The following table gives the results of mechanical analyses of samples of the soil and subsoil of the Clarksville fine sandy loam:

Mechanical analyses of Clarksville fine sandy loam.

| Number. | Description. | Fine gravel. | Coarse sand. | Medium sand. | Fine sand. | Very fine sand. | Silt. | Clay. |
|-------------|--------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|
| | | <i>Per cent.</i> | <i>Per cent.</i> | <i>Per cent.</i> | <i>Per cent.</i> | <i>Per cent.</i> | <i>Per cent.</i> | <i>Per cent.</i> |
| 415747..... | Soil..... | 0.9 | 1.5 | 3.3 | 38.2 | 23.2 | 27.4 | 5.5 |
| 415748..... | Subsoil..... | .3 | .8 | 1.5 | 21.0 | 19.3 | 35.8 | 21.2 |

CLARKSVILLE SILT LOAM.

The soil of the Clarksville silt loam consists of a light-gray to yellowish-brown, compact, heavy silt loam, 6 to 12 inches deep. The subsoil is a yellow, pale-yellow, or yellowish-brown friable silty clay, becoming heavier with depth. In the lower part of the 3-foot section iron concretions or accretions are sometimes encountered and the yellow clay is stained with brown. In some places there is a scattering of very small chert gravel or iron concretions over the surface. Included with the type are local areas of Clarksville fine sandy loam and Guthrie silt loam, too small to show on the map.

The Clarksville silt loam is of small extent. Small areas occur $2\frac{1}{2}$ miles southeast of Ragland, in the vicinity of Odenville, and southward between Odenville and Branchville. The type is also well developed east of Branchville, and other areas occur in the vicinity of Bethel Church. It occupies flat to gently rolling or undulating areas, and in most places is fairly well drained, but there are some flat areas where considerable damage to crops is caused by water remaining on the surface after heavy rains. The type is easily worked and crops mature early. Usually the organic content is very low; even in the forested areas little humus has accumulated, the dark color rarely exceeding a depth of 1 inch. This deficiency is the cause of the compactness of the soil and the lack of a crumblike structure essential to good tilth.

General farm crops can be produced on the Clarksville silt loam more economically than on most of the soils of the county, and probably 60 per cent of it is under cultivation. The remainder supports a mixed growth of oak, some hickory, and other hardwoods. Where cultivated the type is used for the production of cotton and corn, supplemented by occasional crops of oats, wheat, and forage, in addition to the home production of vegetables. The acreage yields of cotton range from one-third to three-fourths bale, of corn from 15 to 45 bushels, oats 20 to 40 bushels, wheat 10 to 20 bushels, and cowpea hay or mixed cowpea and sorghum hay 1 to 2 tons.

This type is generally well handled, with the exception that much of the plowing is not deep enough. Cotton is usually fertilized with a 10-2-2 mixture in amounts that range from 100 to 500 pounds per acre. Some farmers use cottonseed meal or cotton seed. Corn is rarely fertilized, and then usually with stable manure. Sometimes nitrate of soda is used on the small-grain crops.

Land of this type is held at \$30 to \$60 an acre, depending largely on the location.

Artificial drainage should be established on this type and the preparation of the seed bed should be deeper and more thorough. In

addition the incorporation of organic matter is necessary. The interval between cultivated crops should be increased and the land used more generally in the production of leguminous forage crops.

HAGERSTOWN LOAM.

The Hagerstown loam, to a depth of 8 to 12 inches, consists of a brown, yellowish-brown, or reddish-brown loam, of mellow structure. The subsoil begins as a light-brown, yellowish-brown, or reddish-brown, friable silty clay, and usually becomes a compact, heavy clay at about 3 feet. In some places the soil may be distinctly sandy, while in others it approaches a silt loam in texture. The redder colored subsoil predominates on the ridges and the lighter colored subsoil in places where local drainage is not well established. There may be a slight scattering of chert or sandstone over the surface. In the subsoil, particularly where drainage is imperfect, small iron concretions or accretions are abundant and rusty-brown mottlings are conspicuous at or below 3 feet. In places excessive erosion has removed the surface soil and the underlying clay is exposed. Such areas would be mapped as Hagerstown clay loam or clay had their distribution warranted separation. On that part of the type which occurs south and southwest of Odenville the soil is quite sandy, owing to colluvial wash from neighboring uplands.

The Hagerstown loam is an extensive soil, occurring in all parts of the county. Large areas occur south of Riverside. Small areas are mapped in the vicinity of Fergusons Crossroads, east of Yellow Bluff along Little Canoe Creek, in the vicinity of Steele, north of Piney Ridge Mountain, southwest of Ashville, north of Big Canoe Creek, northeast of Cool Springs Church, along Beaver Creek, particularly in the vicinity of Friendship Church, and near the Southern Railroad in places between Red Hill Church and Argo Church.

The type occupies valley lands and ranges from flat to gently rolling. Most of it is comparatively well drained, though in places the drainage is excessive and in others slightly inadequate. The greater part of the type, probably 90 per cent, is under cultivation. The remainder supports a mixed hardwood growth consisting of oak, hickory, poplar, walnut, and pine. Cotton and corn are the principal crops, supplemented by oats, wheat, forage crops, and vegetables. The yields of cotton range from one-half to 1 bale per acre, of corn from 20 to 45 bushels, oats 20 to 40 bushels, wheat 10 to 25 bushels, and cowpea or mixed cowpea and sorghum hay 1½ to 2 tons.

Crops are not generally rotated under any particular system, and corn or cotton may be produced year after year in the same fields. Cotton is usually fertilized with 100 to 500 pounds per acre of a

10-2-2 fertilizer. Stable manure or lot manure, when available, is generally applied on corn lands. Some farms use nitrate of soda as a top dressing for the small grains.

The Hagerstown loam is considered one of the most productive soils in the county for general farm crops. It is quite similar to the limestone soils in Pennsylvania and Virginia. It is held at prices ranging from \$30 to \$60 an acre.

The means recommended for the improvement of the Clarksville silt loam would be applicable to this type.

DECATUR LOAM.

As typically developed the surface soil of the Decatur loam is a brown, reddish-brown, or red loam, 5 to 10 inches deep. The subsoil is a dark-red clay loam which usually grades abruptly into a stiff, heavy, red clay, generally extending to a depth of several feet. In some places the bluish or gray, massive limestone comes to the surface, although this is not common. The Decatur loam includes narrow ridges and knolls of Decatur clay loam and clay, which represent Decatur loam with the surface soil wholly or partly removed by erosion. The Decatur loam also includes some small areas, mainly sinks or depressions, where the soil and subsoil represent an accumulation from colluvial wash from adjoining slopes. Here the soil approaches a silt loam in texture and if extensive enough would be mapped as Decatur silt loam. Included also with the type are local spots of Decatur fine sandy loam, occurring mainly near the uplands. The sand in the surface soil here represents colluvial material from sandstone uplands washed over the typical soil material.

The Decatur loam is the best developed soil of the limestone lowland belts, in which it is widely distributed. It is second to the Colbert soils in importance in Canoe Creek and Cahaba River Valleys. The greater part of the type occurs in the southern part of the county. It is developed in large areas between Pell City and the Coosa River, in the vicinity of Easonville, and to the southwest. A small area is mapped between Steele and Gilbert.

The Decatur loam occupies level to gently rolling country. It is generally well drained and in places the drainage is excessive. Only the occasional sinks and depressions are inadequately drained.

This type is known locally as "red land," and is generally recognized as the most productive type in the county for general farming. It has the peculiar mellow structure so essential to good tilth, but it can not be plowed when wet, as it tends to puddle, or when too dry, as in that condition it breaks in clods. It has a fair average supply of organic matter. Tests with litmus show that over 90 per cent of the type is acid.

This is the most important type in the county, although it is only moderately extensive. Practically all of it is under cultivation. It is used for the production of cotton, corn, oats, wheat, and hay, in addition to vegetables and fruit, grown to supply home demands. Cotton and corn occupy a larger acreage than all other crops combined. The yields of cotton range from one-half to 1 bale per acre, of corn from 30 to 60 bushels, oats 20 to 40 bushels, wheat 15 to 30 bushels, cowpea hay 1 to 1½ tons, and mixed cowpea and sorghum hay 1 to 2 tons.

A little dairying is done on this type, which is well adapted to the industry.

No definite systems of crop rotations are followed. Cotton or corn may be produced year after year in the same fields, or may be alternated, one or more years of each. Commercial fertilizer, generally a 10-2-2 mixture, is used on cotton, in applications ranging from 100 to 500 pounds to the acre. Corn is rarely fertilized with anything except stable manure. Sometimes nitrate of soda is used on the small grains. Occasionally an application of burnt lime is made to correct soil acidity.

Land of this type is held at \$40 to \$75 an acre, depending on the improvements and location.

Effort should be made to prevent the destructive soil wash that occurs in places. Limestone occurs in abundance in proximity to the type, and the use of the crushed rock or of burnt lime would be advisable to neutralize acidity. Crops should be rotated in systems that include the more frequent growing of winter cover crops and the more extensive production of leguminous forage. The Decatur loam is naturally a strong soil, and it can be built up to a high state of productiveness and easily maintained in that condition.

FREDERICK STONY LOAM.

The surface soil of the Frederick stony loam consists of a gray or yellowish-gray loam or silty loam, 5 to 8 inches deep. The subsoil begins as a reddish-yellow or salmon-colored loam, and passes within a few inches into a yellowish-red or reddish-yellow friable clay loam or clay, which rarely exceeds a depth of 2 feet. Over the surface and throughout the soil section, in proportions varying from 20 to 50 per cent of the soil mass, there occur angular chert fragments ranging greatly in size, and below the subsoil is a mass of broken cherty limestone. There are local outcrops of limestone and cherty limestone throughout the type.

The Frederick stony loam is one of the most extensive and widely distributed types in the county. Areas are found northeast of Fergusons Crossroads, west of Gilbert and Steele, on Canoe Creek Moun-

tain, near the Coosa River east of Ragland, south of Pell City, in the vicinity of Morning Star School, west of Coosa River toward Dry Creek, between Pleasant Hill Church and Early Church, and north, west, and southwest of Springville.

The type occupies the lower slopes of the mountains and ridges or isolated ridges or foothills in the lowland belts, and has a steep or rolling topography. Drainage is everywhere adequate and in places excessive, and the run-off is rapid, causing a badly gullied and furrowed surface.

Little or none of this type is under cultivation. Most of it supports a mixed growth of oak and pine. Where the forest growth is light the type affords scanty pasturage. In the more favorable situations it could probably be utilized for growing certain varieties of apples, perhaps in small areas for corn production, and for pasture. Land of this type is valued at \$5 to \$12 an acre.

FREDERICK GRAVELLY LOAM.

The soil of the Frederick gravelly loam consists of a gray or yellowish-gray loam or silty loam, 6 to 8 inches deep. The upper subsoil is generally a compact, yellow or reddish-yellow clay loam which grades at about 12 inches into a yellowish-red, light-red, reddish-yellow, or brown, moderately friable clay. This generally becomes darker and heavier with depth. The subsoil rests upon large fragments of chert or cherty limestone at a depth of 24 inches or more. Over the surface and throughout the soil section there is an abundance of small gray or yellowish-brown, angular chert fragments, and there are occasional outcrops of limestone or cherty limestone throughout the type.

Included with the type are patches of Frederick stony loam, sandy loam, and silt loam, and Clarksville stony loam and gravelly loam, too small to separate.

The Frederick gravelly loam occurs in all parts of the county, usually in association with the Frederick stony loam. It is well developed northeast and north of Fergusons Crossroads, in the vicinity of Gilbert, west and north of Steele, and north and south of Canoe Creek Mountain. Detached areas are mapped along Beaver Creek, and large areas between Pell City and Coosa River, near the Coosa River southwest of Easonville, between Easonville and the Shelby County line, and along the county line in places.

The type occupies mountain foothills or isolated ridges and knobs in the valleys, and the surface may be hilly, rolling, or steeply sloping. It is generally well drained, and on some of the steeper slopes the drainage is excessive and the surface is badly furrowed and gullied.

This is one of the most extensive soils of the county, but not over 40 per cent of it is under cultivation. The remainder supports a mixed growth of oak and other hardwoods. The trees are generally larger than those on the Clarksville stony loam. Where cultivated this soil is used principally for cotton and corn, which are occasionally supplemented by oats, wheat, forage, fruit, and truck crops, the last two grown to supply the domestic needs. Corn yields from 15 to 35 bushels per acre, cotton one-third to one-half bale, oats 15 to 30 bushels, wheat 10 to 15 bushels, and cowpea hay about 1 ton.

Lespedeza, or Japan clover, grows wild, and experimental crops of red clover, timothy, and bluegrass have given good results. The apple trees consist of Ben Davis, York Imperial, and Grimes Golden. The orchards are in a thriving condition, and it would seem that more attention could well be given to apple culture. Blackberries, raspberries, and strawberries also do well, and tomatoes and other garden crops are very successfully grown.

This type is generally considered slightly more productive than the Clarksville stony loam. It is an easy soil to work, except for the presence of the gravel, and it warms up early in the spring. Crops mature early. The open, porous character of the surface soil and the free run-off tend to make the soil droughty, and crops sometimes suffer during dry spells. The conditions in this respect are better on the lower slopes than elsewhere. The soil generally is deficient in organic matter. Litmus tests show the soil to be generally neutral.

Land of this type is valued at \$15 to \$30 an acre, depending on the location, improvements, and other factors.

The rougher and steeper slopes occupied by this soil should not be cultivated but used as pasture land. Deep plowing and the incorporation of organic matter would do much to increase the water-holding capacity of the soil, tend to reduce erosion, and thus add to its general productiveness.

FREDERICK LOAM.

The soil of the Frederick loam consists of a light-gray to yellowish-brown loam, 6 to 10 inches deep. The subsoil is approached through a transition zone of yellow or reddish-yellow silty or fine sandy loam, which at depths ranging from 10 to 18 inches becomes a silty or sandy clay, the color changing to yellowish red, reddish yellow, or light red. The subsoil usually exceeds a depth of 3 feet, is more compact in the lower part, and is underlain by limestone or cherty limestone. The limestone comes to the surface in places, or is exposed where the soil has been removed by surface wash.

In some places the soil is a very fine sandy loam, while in others it is a distinct silt loam, but these textures could not be separated

from the typical loam in mapping. Patches of Frederick gravelly loam occur at the heads of draws, where gravel has concentrated, and patches of Frederick clay loam are included where the surface soil has been removed by erosion and the underlying clay is exposed.

The Frederick loam is a type of small extent. It is confined principally to the eastern part of the county, and occurs near the Coosa River south and southeast of Ragland, and near Harts Ferry. The topography is gently rolling to undulating. The areas lie at the base of the steeper slopes or on terrace-like flats near streams. The drainage is for the most part good, though there are some places where artificial drainage is necessary. The soil washes badly on the steeper slopes.

This is one of the unimportant types of the county, on account of its small extent, but most farming operations can be economically conducted and for this reason it is a valuable type. Most of it is under cultivation, being used for the production of cotton and corn; oats, wheat, forage crops, vegetables, and fruit, the last for home consumption only, are crops of secondary importance. Cotton yields from one-third to three-fourths bale per acre, corn 15 to 40 bushels, oats 15 to 30 bushels, wheat 10 to 20 bushels, and cowpea hay 1 to 1½ tons.

Land of this type of soil is held at \$20 to \$40 an acre.

Applications of lime and the incorporation of organic matter would do much to maintain and increase yields on this soil. It is admirably adapted for the production of general farm crops.

The following table gives the results of mechanical analyses of samples of the soil and subsoil of the Frederick loam:

Mechanical analyses of Frederick loam.

| Number. | Description. | Fine gravel. | Coarse sand. | Medium sand. | Fine sand. | Very fine sand. | Silt. | Clay. |
|-------------|--------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|
| | | <i>Per cent.</i> | <i>Per cent.</i> | <i>Per cent.</i> | <i>Per cent.</i> | <i>Per cent.</i> | <i>Per cent.</i> | <i>Per cent.</i> |
| 415707..... | Soil..... | 0.9 | 7.0 | 6.6 | 19.4 | 18.4 | 39.9 | 7.8 |
| 415708..... | Subsoil..... | .7 | 4.6 | 5.1 | 13.5 | 14.2 | 42.2 | 19.6 |

COLBERT LOAM.

The surface soil of the Colbert loam is a light-gray to yellowish-gray loam, having a depth of 6 to 10 inches. In some places it grades to a fine sandy loam and in others to a distinct silt loam, but these textures could not be separated in mapping. The subsoil for the most part is a pale-yellow, heavy, compact clay or clay loam, but yellow, friable clay is encountered in some places. Fragments of chert and sandstone are scattered here and there over the surface.

The Colbert loam is of small extent, and is largely confined to the northeastern part of the county. Areas lie at the foot of Chandler Mountain, west and north of Steele, and south of that point along the Southern Railroad. Small areas occur elsewhere in association with the Colbert silty clay loam.

The type has a gently rolling to undulating topography. It occurs at the base of steep slopes or on terracelike areas near streams. The surface drainage is good, except in the flatter areas, and these can be drained readily by open ditches or tiles.

The Colbert loam is used for growing cotton and corn, of which fairly good yields are obtained. It is well adapted to general farming, but should be plowed deeper and also improved physically by the incorporation of organic matter. This soil is much easier to till than the Colbert silt loam or silty clay loam.

The following table gives the results of mechanical analyses of samples of the soil and subsoil of the Colbert loam:

Mechanical analyses of Colbert loam.

| Number. | Description. | Fine gravel. | Coarse sand. | Medium sand. | Fine sand. | Very fine sand. | Silt. | Clay. |
|-------------|--------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|
| | | <i>Per cent.</i> | <i>Per cent.</i> | <i>Per cent.</i> | <i>Per cent.</i> | <i>Per cent.</i> | <i>Per cent.</i> | <i>Per cent.</i> |
| 415753..... | Soil..... | 4.0 | 6.0 | 3.1 | 23.0 | 18.0 | 38.3 | 7.7 |
| 415754..... | Subsoil..... | .5 | 1.2 | 2.5 | 30.3 | 9.9 | 38.8 | 16.7 |

COLBERT SILT LOAM.

The soil of the Colbert silt loam consists of a compact, yellowish-brown or brown silt loam, 6 to 10 inches deep. The subsoil is a heavy, yellow silty clay, which usually extends without change to a depth of 3 feet or more. The soil in places contains large quantities of very small iron concretions or accretions. These also occur in the subsoil, or are indicated there by dingy-brown spots which represent either accretions or concretions in process of formation or decay. In patches here and there the lower part of the subsoil is mottled yellow and gray.

This is one of the unimportant types of the county, owing to its very small extent. An area occurs north of Canoe Creek near the Etowah County line, another north of Perimeter Creek near the Etowah County line, and small detached areas along Beaver Creek, north of Argo Church, and along some of the tributaries of Kelly Creek west of Bethel Church.

The areas occupy flat or depressed situations and are generally poorly drained. Only a few patches are used for pasture or hay land, and little or none of the type is under cultivation. Most of it supports a small, thin growth of various oaks and gum, with

scattered hickory, elm, and ash. Without artificial drainage the Colbert silt loam has little agricultural value.

COLBERT SILTY CLAY LOAM.

The soil of the Colbert silty clay loam consists of a gray, pale yellow, or brown silty clay loam, 5 to 10 inches deep. The soil changes abruptly into the subsoil, which is a tough, plastic, yellow clay. With increase in depth this becomes slightly greenish yellow and gray, mottled with drab and not infrequently stained with rusty-brown spots, which may be due to iron concretions in process of formation or decay. Small iron concretions occur in the surface layer and through the 3-foot section. The subsoil rests directly at varying depths, usually below 3 feet, upon calcareous shale or shaly limestone, or massive, gray to black limestone, and these rocks in places outcrop. Most of the rock beds have been tilted to an almost vertical position.

Included with the type are patches of Colbert clay, which represent former areas of the silty clay loam, from which the surface material has been removed by erosion.

The Colbert silty clay loam is one of the most extensive soils of the limestone-valley lowlands. It is well developed in the north-central part of the county. Areas are mapped east, southeast, and south of Steele, north and northwest of Ashville, in practically all of the valley along the Southern Railroad to and including Caldwell, south, west, and northwest of Cedar Mountain, and in the vicinity of Moodys Crossroads and Leeds.

The type has a flat to gently rolling topography, and is locally known as "flatwoods." It includes large tracts of comparatively flat land, the greater part of which is poorly drained. The streams have approached base level and are generally sluggish. The close, impervious character of the subsoil retards the downward percolation of moisture, and water generally remains on the surface for some time after rains.

Probably not over 10 per cent of this type is under cultivation. The rest now supports only a growth of small oak, although the original timber of red oak, black oak, white oak, poplar, and occasional walnut is said to have been very heavy.

Where cultivated the type is used principally for the production of cotton and corn, supplemented by occasional crops of oats and forage. The reported yields of cotton range from one-fourth to one-half bale per acre, of corn from 10 to 40 bushels, oats 10 to 30 bushels, and cowpea or mixed cowpea and sorghum hay from 1 to 1½ tons. Yields depend largely on the condition of the field and the cultural methods. Commercial fertilizers, ordinarily low-grade mixtures, are commonly used for cotton in acreage applications ranging from

100 to 400 pounds. Stable and lot manures are generally used for corn where available.

The Colbert silty clay loam is not always easy to work. If plowed when too wet the soil does not scour from the plow, and if too dry it turns up in clods. The type is generally lacking in organic matter and nearly all of it, indicated by litmus paper tests, is in an acid condition.

Land of this type is valued at \$5 to \$20 an acre, depending on the location, improvements, and drainage.

On most of the type there is need for ditching. As the soil material is generally shallow it is probable that ditches deepened to the bedrock in places would facilitate the drainage. This is naturally a strong soil for grass and grain, but better drainage must be established before maximum yields will be possible. The acidity must be corrected by the use of burnt lime or crushed lime rock, of which there is an ample supply near at hand, and the soil should be put in better tilth by the incorporation of organic matter.

GUTHRIE SILT LOAM.

The surface soil of the Guthrie silt loam consists of a light-gray to whitish, compact, friable, smooth silt loam, having a depth of 5 to 8 inches. The subsoil is a mottled light-gray and whitish, compact, heavy, tough silty clay loam or silty clay. In places the lower part of the subsoil shows mottlings of rusty brown or yellow.

This is one of the least important types in the county. It is of very small extent. One small spot occurs in the immediate vicinity of Pell City while scattered patches are found to the east, southeast, and south of this place. The type also occurs in small areas southwest of Easonville. It occupies depressions and low, flat areas closely associated with the Clarksville, Colbert, Hagerstown, and Decatur soils. The surface drainage is very poor, and water stands on the surface for long periods after rains. Ditching is absolutely necessary to reclaim the soil for agriculture.

Practically none of this type is under cultivation. Most of it is forested with various kinds of oak, including water oak, as well as gum and pine, in addition to other hardwoods. The soil supports a fairly good stand of grass and is used for grazing cattle.

DEKALB STONY LOAM.

The soil of the Dekalb stony loam consists of yellowish-gray, yellow, or light-brown loam, 6 to 10 inches deep. The subsoil is a pale-yellow, or yellow fine sandy clay or friable silty clay. A high percentage of angular sandstone and shale fragments occurs throughout the soil and subsoil, while outcropping ledges of these rocks are

abundant. In general the entire soil section is quite shallow, rarely exceeding a total depth of 18 inches. In the vicinity of Pell City the soil is a gray loam and the subsoil is a yellow, plastic clay which becomes mottled with brown or drab in the lower part of the 3-foot section.

The Dekalb stony loam is much less extensive than the Hanceville stony loam. It is well developed, but in small areas, along the Seaboard Air Line Railway where it crosses Shoal Creek. Small areas occur east of Friendship Church, along the lower slopes of Blount Mountain, east and northeast of New Lebanon Church, west of Jones School, and north of Low Gap Church. Numerous small, unimportant areas are mapped throughout the mountain and ridge country.

The Dekalb stony loam occupies some of the steep, broken, and rough slopes between the mountain or ridge crests and the water courses, and drainage is generally excessive. Soil erosion has kept pace with the decay of the underlying rocks, and as a result the bed-rock frequently outcrops, or fragments from higher levels are thickly strewn upon the surface or bedded in the soil mass.

Owing to its position and stony character practically none of this soil is under cultivation. It supports a mixed growth of red oak, black oak, white oak, blackjack oak, hickory, poplar, and pine. Where the forest growth is thin the type affords some grazing on the various wild grasses and Japan clover.

Land of this type is held at \$5 to \$12 an acre, more for its timber than for its value for agriculture.

DEKALB SHALE LOAM.

The Dekalb shale loam consists of a grayish-yellow, or light-brown silt loam or loam, 5 to 10 inches deep, underlain by a subsoil of silty clay loam or friable clay, light yellow in color, ranging in thickness from a few inches to 15 or 20 inches, where it passes into disintegrated shale. In places the shale lies at the surface or immediately below the soil. Scattered over the surface and mixed with the soil mass is from 20 to 50 per cent of small thin shale chips.

Included with the Dekalb shale loam are patches of Hanceville shale loam, which vary in having a reddish-yellow or yellowish-red subsoil. Such areas are most conspicuous southeast of Zion Church and northeast of Acmar Mines.

The Dekalb shale loam is confined to the western part of the county, in and around Margaret and Acmar Mines, and along the western edge of the county between Corinth Church and the Seaboard Air Line Railway. It has a hilly or rolling surface and is generally well drained. In places the drainage is excessive.

Probably not over 20 per cent of the type is under cultivation. The rest supports a mixed growth of pine and oak. The original

timber, which is said to have been very heavy, was principally oak, poplar, and chestnut.

The soil is easy to work, does not clod, and warms up early in the spring. Crops mature early on it. Some of the most important coal veins in the county occur in the areas of this soil, and the land is held by mining companies, which has discouraged agricultural development. Cotton, corn, oats, wheat, and cowpea hay are the crops produced on the small area under cultivation. The yield of cotton ranges from one-third to one-half bale per acre, of corn from 10 to 20 bushels, oats 15 to 20 bushels, wheat 8 to 12 bushels, and cowpea hay one-half to 1 ton.

Exclusive of mineral rights, land of this type is valued at \$10 to \$20 an acre.

Owing to the hilly topography, this soil erodes severely in places. Little effort is made to prevent the loss occasioned in this way, much of which could be avoided by deeper plowing, by growing winter cover crops, and by terracing.

DEKALB FINE SANDY LOAM.

Dekalb fine sandy loam consists of 8 to 12 inches of yellowish-gray, yellow, or light-brown fine sandy loam, underlain by pale-yellow or yellow, friable fine sandy clay, usually extending to a depth of several feet. In places the sandstone bedrock is encountered within the 3-foot section.

Included with this type are some areas of Dekalb gravelly fine sandy loam, which are shown with gravel symbol on the map. These occupy broken or detached areas along the top of Blount Mountain, and occur to less extent on the smaller ridges northwest and southeast of Jones School and south and southeast of Cooks Springs. There is comparatively little difference in agricultural value between the Dekalb gravelly fine sandy loam and the Dekalb fine sandy loam. The former is usually shallower. Some patches of Hanceville fine sandy loam, which differ only in that the subsoil is red or reddish yellow, and of Dekalb stony loam, have also been mapped with the Dekalb fine sandy loam, on account of their small extent.

The Dekalb fine sandy loam is much more extensive than the Hanceville fine sandy loam. It is well developed on Chandler Mountain and to a less extent on Blount Mountain. Small areas also occur 1 mile southwest of Savages Crossing, and on both sides of Shoal Creek. Gravelly areas occur in the vicinity of Hardwick.

The Dekalb fine sandy loam occupies level to gently rolling upland. It usually occurs on the tops of the highest mountains or divides. As the areas pass into the Dekalb stony loam or Rough stony land the topography becomes more broken and outcropping sandstone ledges

occur. Practically all of the type is well drained, and near the brows of the ridges the drainage in places is excessive.

Despite its small extent this is one of the most important soils of the county. It can be used for the production of a wide range of crops, and the topography is such that these can be grown almost as economically as in the lowland belts. Probably 80 per cent of the type is under cultivation, the remainder supporting a mixed growth of oak, hickory, and pine. Cotton and corn are the leading crops, with potatoes, oats, and cowpea hay of secondary importance. Garden truck and fruit are grown for home use.

A clean staple of cotton is produced, but the yield is light, ranging from one-third to one-half bale per acre. Corn yields from 8 to 15 bushels per acre, sweet potatoes 50 to 125 bushels, Irish potatoes 50 to 60 bushels, oats 10 to 15 bushels, and cowpea hay one-half to 1 ton. All kinds of vegetables do well, maturing much earlier than on the soils of the lowland belts.

Peaches, apples, and other fruits are successfully grown. There seems to be better air drainage in the areas occupied by this type and frosts are not so common as in the valleys. Peaches are a sure crop four years out of five, according to reports. Cotton is usually fertilized with 100 to 400 pounds per acre of a 10-2-2 mixture. Where available stable and lot manure are used for corn and truck crops.

The Dekalb fine sandy loam is an easy soil to work. It is well drained and crops mature early. Since it occupies the tops of mountains and ridges it is more or less inaccessible, and this prevents the commercial development of trucking and fruit growing.

Land of this type is held at \$8 to \$20 an acre, the difference depending principally on the location.

The turning under of stable and lot manure or green-manuring crops would do much to increase the productiveness of this soil.

DEKALB SILT LOAM.

The soil of the Dekalb silt loam consists of yellow, yellowish-gray, or light-brown silt loam, 5 to 10 inches deep. The subsoil consists of a compact, yellow or pale-yellow silty clay loam, which at or about 24 inches becomes a heavy but friable yellow clay. Sometimes in the lower part of the subsoil, especially where the type is not well drained, the clay is mottled yellow and gray. It may also be spotted with rusty brown and contain small iron concretions in process of formation or decay. Certain gravelly areas are shown on the map by symbol.

The Dekalb silt loam occurs principally in the southwestern part of the county, although the largest area is found on Chandler Mountain, in the vicinity of Mount Lebanon Church. Small areas lie 1 mile southwest of Bethany Church, north of Fairview, and south and

southwest of Oak Grove Church. The type is also found in detached areas east and northeast of Cooks Springs, along the public road east of Oak Mountain, south of Poplar Grove School, in the vicinity of and northeast of Brompton, and along the west county line north of the Seaboard Air Line Railway.

The Dekalb silt loam occupies flat to gently rolling country and is well drained, except in places near the hills where it is subject to seepage and is almost permanently wet and along some streams where the fall is slight.

When properly handled this soil is well adapted to the production of general farm crops. Probably 50 per cent of it is under cultivation. The remainder supports a heavy forest growth consisting of oak, hickory, walnut, poplar, birch, and longleaf and shortleaf pine. The cultivated areas are used in the production of cotton and corn chiefly, with smaller acreages in oats, wheat, forage, and garden truck. The yield of cotton ranges from one-third to three-fourths bale per acre, of corn from 20 to 40 bushels, oats 20 to 30 bushels, wheat 10 to 20 bushels, and cowpea hay 1 to 1½ tons.

A 10-2-2 fertilizer is used on cotton, in applications varying from 100 to 400 pounds to the acre. Corn is rarely fertilized with anything but stable manure or lot manure.

Land of the Dekalb silt loam is valued at \$12 to \$20 an acre.

The soil is shallow and compact and may be improved by deeper plowing and the turning under of manure or other organic matter.

HANCEVILLE STONY LOAM.

The surface soil of the Hanceville stony loam consists of a yellow, grayish-yellow, or brown loam, 6 to 10 inches deep. The upper subsoil is a yellow, compact loam or light sandy clay loam, but at about 15 inches it grades into a yellowish-red, reddish-yellow, or red fine sandy clay. This rarely exceeds a depth of 24 inches, and is underlain by disintegrated sandstone. Sandstone and shale fragments are thickly strewn over the surface, and outcropping sandstone ledges are so numerous in places as to interfere with cultivation.

This is the most extensive type in St. Clair County. The greater part of it lies to the south of Shoal Creek or Backbone Ridge. Large areas are mapped north, east, and southwest of Ragland, in the vicinity of Coal City, and west and southwest of Eden. The type also occurs northeast and southeast of Prescott, and east and southeast of Brompton. It is well developed northwest of Stoval Mountain, on Simmons Mountain, and on the lower slopes of Blount Mountain.

The Hanceville stony loam occupies the steep, broken, and rough slopes between the mountain or ridge tops and the streams, and the

drainage is naturally excessive. Owing to its stony character and rough topography, practically none of it is under cultivation. It supports a growth of oak and hickory, with some shortleaf pine. Where the tree growth is thin the type affords scanty pasturage.

This land is held at \$5 to \$12 an acre, its value lying in the forest growth. The type is best suited to forestry uses, although part of it might be devoted to growing apples or grapes, or used for grazing cattle.

HANCEVILLE GRAVELLY LOAM.

As typically developed the Hanceville gravelly loam, to a depth of 5 to 10 inches, consists of a yellowish-brown or reddish-brown loam. The subsoil is a reddish-yellow, yellowish-red, or mottled yellow and red, compact but friable silty or fine sandy clay, which usually extends below a depth of 3 feet. Over the surface and throughout the soil section is a conspicuous amount of brown or dark-colored shale and sandstone chips and fragments. The surface soil may be a fine sandy loam or very fine sandy loam in some places, while in others it may be a distinct silt loam, but these textures could not be separated from the typical loam in mapping. The surface soil is generally shallower than that of the Hanceville fine sandy loam, and in places the underlying subsoil is exposed.

This is an inextensive type. A few small areas occur on the lower slopes of Blount and Chandler Mountains, and along the northern part of Backbone Ridge. The type is typically developed north and northeast of Ragland, and a large area lies east and southeast of Truitt School. Others are mapped in the vicinity of Margaret, south and southwest of Parsons, and between Wolf and Kelly Creeks near the county line.

The Hanceville gravelly loam occupies rolling country or the slopes between streams and ridge crests. These slopes in general are smooth, and rock outcrops are rare. The soil is well drained, and in places the drainage is excessive, the surface in such areas being badly gullied. It is remarkable, considering the topography, that more of the type is not eroded and broken, and much more would be were it not for the protection afforded by the natural vegetation. Most of the eroded spots occur where the land is under cultivation.

Probably more than 20 per cent of this type is cultivated. The rest supports a mixed growth of oak, poplar, and pine. The type is used for the production of cotton and corn, and to less extent for growing small grains and hay. The yield of cotton ranges from one-third to three-fourths bale per acre, of corn from 15 to 30 bushels, oats 15 to 30 bushels, wheat 8 to 15 bushels, and cowpea hay one-half to 1 ton. Apples, cherries, plums, and pears do well, but are grown only for home use. The soil is somewhat more difficult to work than the

Hanceville fine sandy loam, on account of its topographic position, and crops can not be so economically produced.

Land of the Hanceville gravelly loam is valued at \$10 to \$20 an acre, the higher prices being for better improved farms conveniently located with respect to towns or for tracts supporting valuable stands of timber.

The steeper fields on this type should be terraced, to prevent erosion. Deep plowing and the addition of organic matter would also do much to increase the water-holding capacity of the soil and thus reduce the injury from wash. Most of this land could be profitably used for growing apples, pears, cherries, and plums. The York Imperial apple gives results comparing favorably with those obtained in the apple section of Maryland.

Hanceville gravelly loam, steep phase.—The Hanceville gravelly loam, steep phase, is essentially the same as the typical Hanceville gravelly loam, except that the surface soil is generally shallower, outcropping ledges of rock are more numerous, and the topography is much steeper and much more broken than in the typical soil. The land is practically unsuited for agriculture. It supports a mixed growth of hardwoods and scattering pine. Some of the more thinly forested land has some value for pasture.

The steep phase is of very small extent. Most of it occurs in the southern part of the county between Wolf and Kelly Creeks, near the county line. Small areas lie east and west of Backbone Mountain and there are also a few patches on Beaver Mountain.

HANCEVILLE FINE SANDY LOAM.

The soil of the Hanceville fine sandy loam consists of yellowish-gray, yellow, or light-brown fine sandy loam, 10 to 12 inches deep. The subsoil is a red, reddish-yellow, or yellowish-red, friable fine sandy clay loam or clay, usually extending to depths greater than 24 inches. It rests directly upon red, brownish-red, or pink sandstone that contains seams of yellow and gray sandstone. In places where erosion has been severe the sandstone outcrops, and in some areas the soil rests upon the bedrock, no subsoil having developed.

Included with the Hanceville fine sandy loam as mapped are patches of Hanceville loam, characterized by a red loam surface soil and a deep-red, fine sandy clay subsoil. One of these areas occurs $3\frac{1}{2}$ miles southeast of Cooks Springs, another on the south slope of Simmons Mountain about 1 mile west of New Lebanon Church, and others northeast and southeast of Argo Church.

The Hanceville fine sandy loam occurs on mountains and ridges in all parts of the county. Areas are mapped south and southwest of Cooks Springs, on the ridges south of Corinth Church toward the

Jefferson County line, on Simmons Mountain, and east and north-east of Asheville. Scattered areas lie on Shoal Creek Mountain.

The areas form the crests of ridges or the plateau-like tops of the mountains, and the surface is flat or gently rolling. The drainage is good to excessive, the latter condition being especially noticeable near the brows of the ridges.

Probably 80 per cent of the Hanceville fine sandy loam is under cultivation. The rest supports a mixed growth of oak, hickory, shortleaf pine, with poplar and persimmon. Cotton and corn are the main crops. Potatoes, oats, hay, with vegetables and fruit for home use, are also grown. The yield of cotton ranges from one-third to three-fourths bale per acre, of corn from 10 to 25 bushels, Irish potatoes 40 to 60 bushels, sweet potatoes 75 to 150 bushels, oats 15 to 20 bushels, and cowpea hay about 1 ton per acre. All kinds of vegetables do well, maturing about the same time as on the Dekalb fine sandy loam. Peaches, apples, strawberries, and other fruits give good results. The peach crop is almost certain at the altitude at which this soil occurs. Much of this type could well be more generally used for growing fruit and truck crops, but for the difficulty of transportation and the distance from markets.

The Hanceville fine sandy loam is an easy soil to work, and crops mature early. It is considered a stronger soil than the Dekalb fine sandy loam. The land is valued at \$10 to \$20 an acre.

This soil is generally deficient in organic matter, which can be supplied by the turning under of green-manuring crops and stable manure. The soil is inclined to be droughty, and the yields are larger in wet than in dry seasons. The incorporation of organic matter would do much to increase the water-holding capacity of the type and add materially to its productiveness. The interval between cultivated crops should be lengthened by the adoption of rotations including leguminous forage crops and grasses.

HANCEVILLE SILT LOAM.

The typical surface soil of the Hanceville silt loam is a yellow, or yellowish-brown, or brown silt loam, 6 to 10 inches deep. The subsoil is a compact, friable fine sandy clay or silty clay of a yellowish-red, reddish-yellow, or mottled red and yellow color. The subsoil in most places exceeds a depth of 3 feet and rests upon a red, gray, or yellow, disintegrated sandstone or shale, but the bedrock is exposed in some areas.

There are included with the type as mapped some local developments of Hanceville fine sandy loam, stony loam, and gravelly loam, the areas being too small to separate on the map.

The Hanceville silt loam is of small extent, and largely confined to the southwestern part of the county. Areas are mapped west of

Fairview, along the forks of Trout Creek 1 mile east and southeast of Ragland, northeast and southwest of Cooks Springs, and north and southwest of Franklin School. The type occupies rolling areas or the slopes between the ridge crests and the stream valleys. It is generally well drained.

This is one of the unimportant soils of the county. Nearly all of it can be used for cultivated crops, although their production will be more expensive than on the more level valley lands, on which all kinds of improved machinery can be used. Probably not more than 30 per cent. of the type is under cultivation. The rest supports a mixed hardwood forest. In logged-off areas pine is generally conspicuous.

The Hanceville silt loam is used principally for the production of cotton and corn, with oats, wheat, and cowpea hay occupying smaller acreages. Most of the farm houses are surrounded by orchards or vegetable gardens. Cotton yields from one-third to three-fourths bale per acre, corn 15 to 30 bushels, oats 20 to 30 bushels, wheat 8 to 15 bushels, and cowpea hay about 1 ton. Pears, apples, cherries, and plums do well, though their production on a commercial scale has not been attempted.

Cotton is usually fertilized, ordinarily with low-grade mixtures, at the rate of 100 to 400 pounds per acre. Corn is rarely fertilized with commercial mixtures, but stable or lot manure is used wherever available.

Land of the Hanceville silt loam is valued at \$10 to \$20 an acre, the price varying with the character of the improvements, the location, and the surface features of the particular tract.

This soil is generally too compact for easy cultivation. It also erodes badly, and in places the fields have become deeply gullied. Deep plowing and the incorporation of organic matter will improve the tilth and retard washing. It would seem that this type could be profitably used for stock raising. The native grasses do well, and there is an abundance of good water. With proper soil management leguminous forage crops and other crops for feeding live stock can be successfully produced. There seems also a possibility for the development of fruit growing, at least to supply summer fruits to the mining towns and other nearby markets.

Hanceville silt loam, steep phase.—The soil and subsoil of the Hanceville silt loam, steep phase, are essentially the same as in the typical Hanceville silt loam, except that the mantle of soil material is generally shallower and outcrops of the bedrock are more abundant. The phase is separated because of its extremely steep, rough, and broken topography. It has practically no agricultural value. Areas occur on the north side of Backbone Ridge, southwest of Pilgrims

Rest Church, northwest of Cliff, and on the slopes and uplands east of the Cahaba River, with many unimportant areas throughout the higher uplands.

The following table gives the results of mechanical analyses of samples of the soil and subsoil of the typical Hanceville silt loam:

Mechanical analyses of Hanceville silt loam.

| Number. | Description. | Fine gravel. | Coarse sand. | Medium sand. | Fine sand. | Very fine sand. | Silt. | Clay. |
|-------------|--------------|-------------------------|-------------------------|-------------------------|-------------------------|--------------------------|--------------------------|--------------------------|
| 415709..... | Soil..... | <i>Per cent.</i> 0.4 | <i>Per cent.</i> 0.7 | <i>Per cent.</i> 0.6 | <i>Per cent.</i> 7.5 | <i>Per cent.</i> 15.5 | <i>Per cent.</i> 61.2 | <i>Per cent.</i> 14.0 |
| 415710..... | Subsoil..... | 1.0 | .8 | .3 | 12.5 | 21.8 | 36.5 | 27.2 |

UPSHUR STONY LOAM.

The Upshur stony loam consists of an Indian-red or reddish-brown, mellow loam, 6 to 12 inches deep, underlain by a red or Indian-red to purplish, friable clay or fine sandy clay subsoil. The surface soil in places is yellowish to almost gray, especially near the boundaries with the Clarksville and Frederick types. In many places rusty-brown mottlings are encountered in the lower part of the 3-foot section. Patches also occur in which the soil is distinctly sandy and the subsoil a friable sandy clay. Bedrock may be encountered at any depth below 24 inches. Over the surface and through the soil section there occur angular brown or reddish-brown sandstone or iron-ore fragments. Areas in which these stones are not conspicuous would be mapped separately as Upshur loam if their extent warranted it. On the steep slopes of Cahaba Mountain, near the contact with the Frederick stony loam, chert gravel also occurs on the surface.

The Upshur stony loam is of very small extent and confined to the south slopes of Canoe Mountain, the lower slopes of Bear Mountain, and the greater part of Cahaba Mountain. It usually occurs at the foot of the slopes to the lowland, but in some places lies on the tops of hills. It is well drained. Erosion is active and in places the surface soil has been completely removed and the underlying clay exposed.

About 50 per cent of this type is under cultivation. It is used for the production of cotton, corn, wheat, oats, and forage crops. The yield of cotton is about the average for the county. Corn yields 20 to 35 bushels per acre, oats 15 to 30 bushels, wheat 10 to 20 bushels, and mixed forage crops 1 to 1½ tons to the acre. This is considered one of the strongest upland soils of the county. Where it is not cultivated it supports a heavy mixed growth of hardwoods. Where the original forest has been removed longleaf and short-

leaf pine are conspicuous. Most of the land is held by large corporations interested in its mineral value, and much of the type that has been sold to the farmers is exclusive of the mineral rights.

The Upshur stony loam is generally recognized as a strong soil, well adapted to general farming, but on account of its topographic position crops can not be as economically grown as on the more level soils. Some effort should be made to protect the slopes from erosion. Deeper plowing and the incorporation of organic matter would do much to control washing on all but the steepest slopes.

Land of this type, without mineral rights, can be bought for \$8 to \$20 an acre.

MONTEVALLO GRAVELLY SILT LOAM.

The Montevallo gravelly silt loam consists of a gray to brownish or yellowish silt loam, from 5 to 8 inches deep, underlain by a subsoil of reddish-yellow or reddish-brown, stiff, plastic clay, mottled with yellow, drab, or deep red colors. It is generally shallow, rarely extending beyond a depth of 20 to 36 inches before passing into disintegrated shale.

Over the surface and throughout the soil section there is a high percentage of angular shale and sandstone gravel. These are for the most part small, thin, and platy, and rarely interfere with cultivation, but in places large fragments, together with an abundance of small particles, make tillage difficult. A few areas included with the type, particularly the area in Shoal Creek Valley east of the Ragland-Ashville Road, are quite free from gravel and the surface is usually more friable. If these areas were of sufficient extent they would be mapped as Montevallo silt loam.

The Montevallo gravelly silt loam is developed in the part of the county lying southeast of the Coosa coal fields, especially in the vicinity of Coal City, Pell City, and Eden. It is a lowland belt type and has a flat to gently rolling surface, with here and there depressions and low hills, knolls and ridges.

The greater part of the type is fairly well drained, but there are some flat areas where drainage is poor. This is especially true of that section toward the eastern end of Shoal Creek Valley. In some places drainage is excessive and owing to the rapid run-off the surface is badly gullied.

The Montevallo gravelly silt loam is not considered a very productive soil. It appears to be more susceptible to extremes of drought and moisture than most of the soils. Only about 30 per cent of it is under cultivation. Most of it is covered with a mixed growth of longleaf pine, shortleaf pine, oak, hickory, and gum. The cultivated areas are used principally for the production of cotton, corn,

and oats. Cotton yields about one-fourth bale per acre, corn 10 to 20 bushels, and oats about 15 bushels.

Land of this type is held at \$7 to \$20 an acre.

The Montevallo gravelly silt loam is better adapted to the grasses forage crops, and small grains than to the intertilled crops. More attention should be paid to increasing the productiveness of this soil through the incorporation of organic matter by applying barnyard manure or by growing leguminous crops. Better drainage in places and deeper plowing would increase the yield of crops. Tests show the soil over wide areas to be acid, and the addition of lime should prove beneficial. An application of about 2 tons of crushed lime rock to the acre would obviate to a great extent the trouble now experienced in obtaining stands of red and crimson clover.

The following table gives the results of mechanical analyses of samples of the soil and subsoil of the Montevallo gravelly silt loam:

Mechanical analyses of Montevallo gravelly silt loam.

| Number. | Description. | Fine gravel. | Coarse sand. | Medium sand. | Fine sand. | Very fine sand. | Silt. | Clay. |
|-------------|--------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|
| | | <i>Per cent.</i> | <i>Per cent.</i> | <i>Per cent.</i> | <i>Per cent.</i> | <i>Per cent.</i> | <i>Per cent.</i> | <i>Per cent.</i> |
| 415733..... | Soil..... | 2.9 | 3.2 | 1.9 | 17.1 | 18.7 | 43.8 | 12.4 |
| 415734..... | Subsoil..... | 2.0 | 4.2 | 1.4 | 4.7 | 4.6 | 34.3 | 48.8 |

ELK FINE SANDY LOAM.

The surface soil of the Elk fine sandy loam is a brown to slightly reddish-brown or grayish-brown, heavy fine sandy loam, 6 to 8 inches deep. The subsoil is a brownish-yellow to light-brown, friable silty clay loam or clay. In places the surface soil is a loam, and the subsoil occasionally is slightly mottled with gray or brown in the lower part of the 3-foot section. This is particularly the case where the type occurs near bluffs and is subject to the collection of seepage water.

The Elk fine sandy loam, which is of small extent, occupies terraces along the Coosa River northwest of Harts Ferry and southwest of Newport Church. Areas are also mapped northeast of Riverside, southwest of Ogletree Island, and along the river to the Shelby County line. The type also occurs along the Cahaba River.

This soil is developed in small areas on the second bottoms and terraces, and the surface is generally flat, though with a slight inclination toward the upland and toward the watercourses. It lies sufficiently high above the first bottoms to escape overflow, and it is generally well drained.

Most of the type is under cultivation, although there still remain small areas of forest, consisting of oak, hickory, gum, and other

hardwoods as well as pine. Cotton, corn, oats, cowpeas, sorghum, and potatoes are the leading crops. The yields reported range from one-third to one-half bale of cotton, 20 to 30 bushels of corn, 20 to 30 bushels of oats, 100 to 150 bushels of sweet potatoes, and 1 to 1½ tons of cowpea hay to the acre.

Cotton is usually fertilized with 100 to 400 pounds per acre of a 10-2-2 preparation. Stable manure where available is applied to corn land. The soil is easy to handle, and with the exception of a few poorly drained patches crops mature early. Deep plowing and the incorporation of organic matter would increase the power of the soil to hold water and thus materially increase yields. Definite crop rotations should be planned to avoid the constant growing of clean cultivated crops, which practice tends to deplete the organic matter in the soil.

Land of this type is held at prices ranging from \$20 to \$40 an acre, depending largely on the location.

HOLSTON SILT LOAM.

The Holston silt loam consists of a brown or grayish-brown silt loam, 8 to 10 inches deep, resting on a subsoil of brownish-yellow or light brown, friable loam or clay loam. In places there is some rusty-brown or gray mottling in the lower part of the subsoil, and the surface soil, locally, may be a brown fine sandy loam or loam, or lighter in texture than typical.

This type is of very small extent in St. Clair County. It is well developed in detached areas along Broken Arrow and Wolf Creeks, and along Trout Creek and its tributaries east and southeast of Ragland. It occupies second bottoms, or terraces, sufficiently high above the streams to be protected from overflows and to have fairly good drainage. Some of the lower and flatter areas, however, may require artificial drainage.

Where this soil is properly managed it gives good yields of corn, and forage crops. It is easy to handle, and responds readily to the addition of commercial fertilizer or manure. The land ranges in price from \$15 to \$40 an acre.

HUNTINGTON SILT LOAM.

The Huntington silt loam has a surface soil of yellowish-brown to dark-brown, mellow silt loam, 8 to 10 inches deep. The subsoil is lighter in color, ranging from dark yellow to dull brown. It consists of a friable silty clay or clay which may continue without change to 3 feet, but which more often at about 24 inches becomes mottled with gray, yellow, and brown, and contains some rusty-brown iron concretions or accretions.

Along the tributaries of the east fork of the Cahaba River, south-east of Springville, the soil and subsoil are more generally shallow, and cherty gravel occurs scattered over the surface and mixed with the soil material to a depth of 3 feet or more. The type also includes some local developments of Huntington fine sandy loam and clay loam, which were not of sufficient size to allow separation.

The Huntington silt loam is well developed along Big Canoe, Little Canoe, Permeter, and Beaver Creeks. It also occurs in narrow, detached strips along Coosa and Little Cahaba Rivers. The type occupies flat to level first bottoms, and consists of alluvium washed from the limestone soils.

The first bottoms occupied by this soil are subject to occasional flooding, but otherwise they are comparatively well drained, except in low places here and there that are almost permanently wet and need artificial drainage. A large proportion of the type is under cultivation or used for pasture. Land not in cultivation supports a mixed growth of hardwoods. The type is devoted principally to the production of corn, oats, and forage crops. The yield of corn ranges from 30 to 50 bushels per acre; of oats, from 20 to 40 bushels; cowpea hay, 1 to 1½ tons; and mixed cowpea and sorghum hay, 1 to 2 tons. Cotton is grown occasionally, and when the season is favorable yields from one-half to 1 bale to the acre.

It is not uncommon for corn to be grown in the fields on this soil year after year without material decline in yield, which is maintained by the addition of fresh soil with every flood. These floods, however, cause some uncertainty in the time of planting and in the outcome of the crop. Diking and straightening the streams would do much to prevent present losses. Lower-lying parts of the type should be drained by ditches or tiles.

This land is disposed of only in conjunction with contiguous soils, and a separate sale value can not be assigned to it.

HOLLY SILT LOAM.

The Holly silt loam consists of a gray to whitish, mellow silt loam, 6 to 8 inches deep, underlain by a yellow, or mottled light grayish or yellow, compact silty clay loam or clay.

The type represents material washed from the lighter colored contiguous upland limestone soils, with an admixture of materials from sandstones and shales, deposited in the first bottoms along streams. It has a flat surface or may occur in slight depressions. It generally lies only a few feet above the normal level of the streams, and is subject to frequent overflows. It is naturally poorly drained. Only a few patches have been cleared and ditched. These are used for growing corn. Most of the type is either forested with hardwoods and gum. Some use is made of the lands as pasture.

POPE FINE SANDY LOAM.

The Pope fine sandy loam consists of a light brown or yellowish-brown fine sandy loam, from 5 to 10 inches deep, grading into a yellow or brownish-yellow fine loamy sand, fine sandy loam, or light fine sandy clay, which usually continues to a depth of 2 feet or more. Sometimes mottlings of rusty brown or gray are found in the lower part of the 3-foot section. Near the water courses the subsoil is a loamy sand or fine sandy loam, while away from the streams the substratum becomes heavier and consists of fine sandy clay with interbedded loamy fine sand or fine sandy loam.

This type is of very small extent. It occurs in the first bottoms along Broken Arrow, Black, and Little Black Creeks and their tributaries, along Muckleroy Creek, in places along Kelly Creek, and along Cane Creek west of Mount Pleasant Church.

The type occupies flat or sloping areas adjoining the streams. It is comparatively well drained, although subject to frequent overflow during the winter and early spring. It is not flooded to as great an extent as the Pope silt loam, and, owing to the more open nature of the soil, water does not remain on the surface long after rains. Poor drainage exists in some places, however, especially near the upland bluffs or steeper slopes, where it is subject to seepage.

The greater proportion of the Pope fine sandy loam is cleared and well improved, and it is considered a valuable and productive soil. It is rarely in need of fertilization, as the soil is renewed from time to time by the fresh sediments left by overflows. The type is used for the production of a wide range of crops, although corn is the principal one. The yields range from 20 to 30 bushels per acre. It is considered one of the best truck soils of the valleys. Both sweet potatoes and Irish potatoes do well, while turnips, carrots, beets, cabbage, cauliflower, tomatoes, and beans give especially good results.

This land is rarely sold alone, as it generally occurs in small areas closely associated with contiguous upland types. The price of the land ranges from \$15 to \$40 an acre, depending on the location, farm improvements, and proximity to railroads or markets.

The following table gives the results of mechanical analyses* of samples of the soil and subsoil of the Pope fine sandy loam:

Mechanical analyses of Pope fine sandy loam.

| Number. | Description. | Fine gravel. | Coarse sand. | Medium sand. | Fine sand. | Very fine sand. | Silt. | Clay. |
|-------------|--------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|
| | | <i>Per cent.</i> | <i>Per cent.</i> | <i>Per cent.</i> | <i>Per cent.</i> | <i>Per cent.</i> | <i>Per cent.</i> | <i>Per cent.</i> |
| 415731..... | Soil..... | 0.3 | 1.5 | 6.0 | 40.1 | 23.1 | 21.8 | 7.2 |
| 415732..... | Subsoil..... | .0 | .3 | 1.8 | 27.5 | 25.4 | 28.6 | 16.3 |

POPE SILT LOAM.

The surface soil of the Pope silt loam is a light-brown to grayish-brown, mellow silt loam, ranging in depth from 6 to 10 inches. It is underlain by brownish-yellow or pale-yellow friable silty clay loam or clay. This may extend without change to a depth of 3 feet or more, or in the lower part of the 3-foot section may show some mottlings of gray or rusty brown.

The Pope silt loam has a very small extent in St. Clair County. It occupies the first bottoms along the branches of Coosa River south of Cliff, and along Trout, Wolf, the upper part of Kelly, and Shoal Creeks and their tributaries.

The soil occupies flat areas generally lying only a few feet above the normal water level of the streams, and it is subject to frequent overflow. Part of the type, nevertheless, is well drained. As a whole the land lies slightly lower than the associated Pope fine sandy loam.

The type is used in growing corn and forage crops, to which it is well adapted. Part of it may have to be ditched, especially the flat or depressed areas, and in places the streams may have to be diked to prevent severe overflows, if maximum yields are to be obtained.

The following table gives the results of mechanical analyses of samples of the soil and subsoil of the Pope silt loam:

Mechanical analyses of Pope silt loam.

| Number. | Description. | Fine gravel. | Coarse sand. | Medium sand. | Fine sand. | Very fine sand. | Silt. | Clay. |
|-------------|--------------|------------------|------------------|------------------|------------------|--------------------|------------------|------------------|
| | | <i>Per cent.</i> | <i>Per cent.</i> | <i>Per cent.</i> | <i>Per cent.</i> | <i>Per cent.</i> | <i>Per cent.</i> | <i>Per cent.</i> |
| 415719..... | Soil..... | 0.0 | 0.3 | 0.2 | 13.4 | 27.4 | 44.8 | 14.0 |
| 415720..... | Subsoil..... | .0 | .1 | .1 | 11.4 | 22.5 | 44.0 | 21.8 |

ROUGH STONY LAND.

Areas so stony and of such rough topography as to be wholly unfit for any agricultural use are classified as Rough stony land. The areas of this character are found on the mountains and ridges and the interstitial soil, where there is any, is of one or another of the mountain types. The line between the Rough stony land areas and the various stony types of soil are in places arbitrary, and little value would result from the effort to draw them with greater definiteness, as the question has little agricultural significance.

SUMMARY.

St. Clair County is situated in the north-central part of Alabama. It has an area of 633 square miles, or 405,120 acres. The county includes portions of the Coosa and Cahaba coal fields, and topographi-

cally consists of mountains and ridges and narrow and broad lowland belts, traversed by the Cahaba and Coosa Rivers, and their tributaries. The range in elevation is from 450 to 11,601 feet above sea level. Drainage is effected by the Cahaba and Coosa River systems.

The climate of St. Clair County is mildly temperate, healthful, and well suited to agriculture. The rainfall is ample and well distributed throughout the year, while the growing season is long, averaging 211 days.

Originally the county was heavily forested, but much of the merchantable timber has been removed, and over 55 per cent of the total area is now in farms. The principal crops are cotton and corn, supplemented by hay (cowpea, mixed cowpea and sorghum, or grain cut green) oats, sorghum, sweet potatoes, Irish potatoes, peanuts, vegetables, and fruits.

The upland soils of this county are residual, derived through the decomposition and weathering of sandstone, shales, and limestones. The alluvial soils, occupying flood plains and terraces along streams, are inextensive. They represent material washed from the uplands, and deposited along the streams.

Fifteen soil series, including 29 types, and not including Rough stony land, are mapped in St. Clair county.

The Hanceville stony loam is the most extensive type. It is a mountain soil, and comparatively little of it is used for agricultural purposes. The Hanceville silt loam and gravelly loam and their steep phases are inextensive soils, slightly more productive than the same members of the Dekalb series. They are better adapted to the growing of forage crops and for grazing, than for cultivated crops. The Hanceville fine sandy loam has a very limited distribution. It is said to be more productive than the Dekalb fine sandy loam, and is well adapted to the production of fruit and truck and forage crops.

The Montevallo gravelly silt loam is not considered a very productive type, but under proper methods it could be made a desirable soil for grasses, grains, and forage crops.

The Pope silt loam is an alluvial soil, subject to overflow, with good drainage it is well adapted to corn, grass, and forage crops. The fine sandy loam is more extensive than the silt loam. It is better drained and is considered one of the most valuable soils of the mountain valleys for general-farm crops.

The Upshur stony loam is of very small extent, but it is recognized as a strong soil for general farm crops. The topography is rather unfavorable to economical farming.

The Dekalb fine sandy loam is an excellent soil for fruit and early truck, but remoteness from market is against commercial development. The silt loam is a less extensive but a better general-farming soil. The stony loam and shale loam are largely undeveloped.

The Frederick stony loam is one of the most extensive soils of the county. It is stony and of rough topography and little or none of it is under cultivation. It furnishes a little grazing. The Frederick gravelly loam is also an extensive soil, used principally for cotton and corn, and well adapted to all general farm crops. The Frederick loam, a soil of small extent, is well adapted to general farm crops, the topography being favorable for the use of all kinds of labor-saving machinery.

The Holston silt loam and the Elk fine sandy loam are alluvial soils occupying the higher and generally well-drained terraces along the larger water courses. They are both inextensive, but well adapted to the production of the general farm crops.

The Huntington silt loam and Holly silt loam occupy first bottoms along streams and are subject to frequent overflows. The former is generally the better drained and more productive, but both soils produce good crops of corn and under favorable conditions can be used in the production of other forage and hay crops.

The Guthrie silt loam is a very inextensive soil, poorly drained and of practically no agricultural value at present.

The Clarksville stony loam is an extensive soil, but it is generally too broken and stony for agriculture. It furnishes scanty pasturage. Most of the type should be allowed to reforest. The Clarksville gravelly loam also has a rather large extent. It is used generally for the production of cotton and corn, but is adapted to most general farm crops. The Clarksville fine sandy loam is an excellent soil for truck, but conditions at present would not justify the development of the trucking industry. The Clarksville silt loam, although of small extent, is an important type on account of its productiveness. It is used for general farm crops, to which it is well adapted. Some parts of the type need drainage.

The Colbert silt loam is generally poorly drained, and better drainage must be established before the type can be farmed profitably. The Colbert silty clay loam is the most extensive soil of the lowland belts. Probably not over 10 per cent of it is used for farming. It is locally called "flatwoods." Some of it is poorly drained. Good results are obtained on this type with proper methods, and much of it could be made good land for the production of grain and grasses. The Colbert loam is naturally well adapted to the production of the general farm crops.

The Decatur loam covers about 16,000 acres in the lowland belt section of the county. It is considered locally to be the most productive soil in the county.

Rough stony land comprises steep mountain and ridge slopes, and has no agricultural value.