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SOIL SURVEY

Chambers County Alabama

UNITED STATES DEPARTMENT OF AGRICULTURE
Soil Conservation Service
In cooperation with
ALABAMA DEPARTMENT OF AGRICULTURE AND INDUSTRIES
ALABAMA AGRICULTURAL EXPERIMENT STATION

HOW TO USE THE SOIL SURVEY REPORT

THIS SOIL SURVEY of Chambers County will serve several groups of readers. It will help farmers in planning the kind of management that will protect their soils and provide good yields; assist engineers in selecting sites for roads, buildings, ponds, and other structures; aid prospective purchasers in choosing real estate; and add to the soil scientist's fund of knowledge.

In making this survey, soil scientists walked over the fields and woodlands. They dug holes and examined surface soils and subsoils; measured slopes with a hand level; noticed differences in growth of crops, weeds, and brush; and, in fact, recorded all the things about the soils that they believed might affect their suitability for farming, engineering, forestry, and related uses.

The scientists plotted the boundaries of the soils on aerial photographs. Then, cartographers prepared from the photographs the detailed soil map in the back of this report. Fields, woods, roads, and many other landmarks can be seen on the map.

Locating the soils

Use the index to map sheets to locate areas on the large map. The index is a small map of the county numbered to show where each sheet of the large map is located. When the correct sheet of the large map is found, it will be seen that boundaries of the soils are outlined, and that there is a symbol for each kind of soil. All areas marked with the same symbol are the same kind of soil, wherever they appear on the map. Suppose, for example, an area located on the map has the symbol Bc. The legend for the detailed map shows that this symbol identifies Buncombe loamy sand. This soil and all the others mapped in the county are described in the section, The Soils of Chambers County.

Finding information

Few readers will be interested in all of the soil report, for it has special sections for different groups. The section, General Nature of the Area, which discusses the physical geography, history and development, and agriculture of the county, will be of interest mainly to those not familiar with the area.

Farmers and those who work with farmers can learn about the soils in the section, The Soils of Chambers County, and then turn to the section, Use, Management, and Productivity of Soils. In this way they first identify the soils on their farm and then learn how these soils can be managed and what yields can be expected. The soils are grouped by capability units; that is, groups of soils that need similar management and respond in about the same way. For example, in the detailed soil descriptions, Buncombe loamy sand is shown to be in capability unit IIe–2. The management this soil needs therefore will be stated under the heading, Capability unit IIe–2, in the section, Use, Management, and Productivity of Soils.

Soil scientists will find information about how the soils were formed and how they were classified in the section, Morphology and Genesis of soils.

* * * *

To provide a basis for the best agricultural uses of the land, this soil survey was made cooperatively by the Soil Conservation Service, the Alabama Department of Agriculture and Industries, and the Alabama Experiment Station. Fieldwork for this survey was completed in 1956. Unless otherwise specified, all statements in this report refer to conditions in the county at that time.

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SOIL SURVEY OF CHAMBERS COUNTY, ALABAMA

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Report by O. R. CARTER and E. A. PERRY

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United States Department of Agriculture in cooperation with the Alabama Department of Agriculture and Industries and the Alabama Agricultural Experiment Station

CHAMBERS COUNTY is in east central Alabama (fig. 1). It has an area of 598 square miles, or 382,720 acres. The State of Georgia borders on the east, Lee County on the south, Tallapoosa County on the west, and Randolph County on the north. Lafayette is the county seat. The Chattahoochee River forms a part of the southeastern boundary, and the Tallapoosa River cuts across the northwestern corner of the county.

Soil Associations

In mapping a county or other large tract, it is fairly easy to see definite differences as one travels from place to place. There are many obvious differences in shape, gradient, and length of slopes; in course, depth, and speed of the streams; in the width of the bordering valleys; in kinds of native plants; and even in the kinds of agriculture. With these more obvious differences there are less easily noticed differences in the pattern of soils.

By drawing lines around the different patterns of soils on a small map, one can obtain a map of general soil areas, which is called a soil association map. Such a map is useful to those who want a general idea of the soils; who want to compare different parts of a county; or who want to locate large areas suitable for some particular kind of agriculture or other broad land use.

A soil association may contain a few soils or many soils, and these soils may be similar or different. An association generally contains many soils, but most of them will not be important because of their small acreage. Two or three soils will be outstanding in the soil pattern. The soil associations are named for the dominant soils in the pattern.

Five soil associations were mapped in Chambers County. Their distribution and extent are shown in figure 2.

Appling-Durham Association

The two areas of this association are on gently to strongly sloping upland in the western part of the county. The parent rock is mainly granite and gneiss. The soils are moderately deep to deep and moderately well drained to well drained. They have a sandy loam surface soil and a clay loam to clay subsoil. Angular fragments of quartz are common, and some areas are severely eroded.

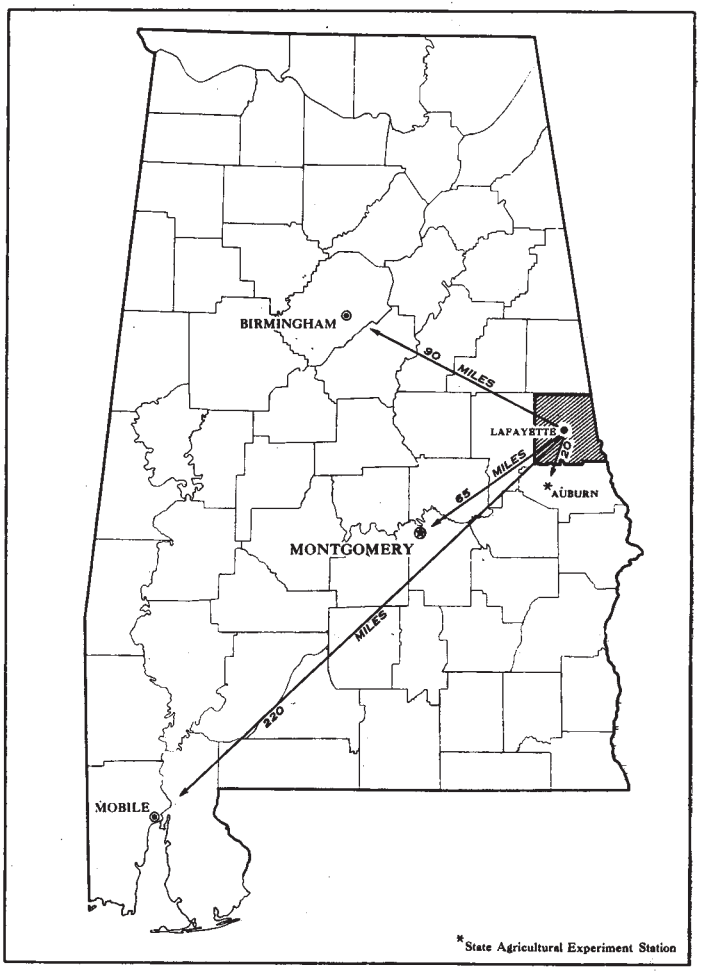

Figure 1.—Location of Chambers County in Alabama.

This association covers about 8 percent of the county. The acreage is distributed approximately as follows:

Soil:	*Percentage of total acreage*
Appling and Durham	60
Cecil and Lloyd	20
Louisburg, Helena, and Colfax	10
Other (poorly drained soils on local alluvium and sandy alluvium)	10

About half of the acreage in this association is in capability classes II and III. Of the remaining half, 30 percent is in class IV, and 20 percent is in class VI.

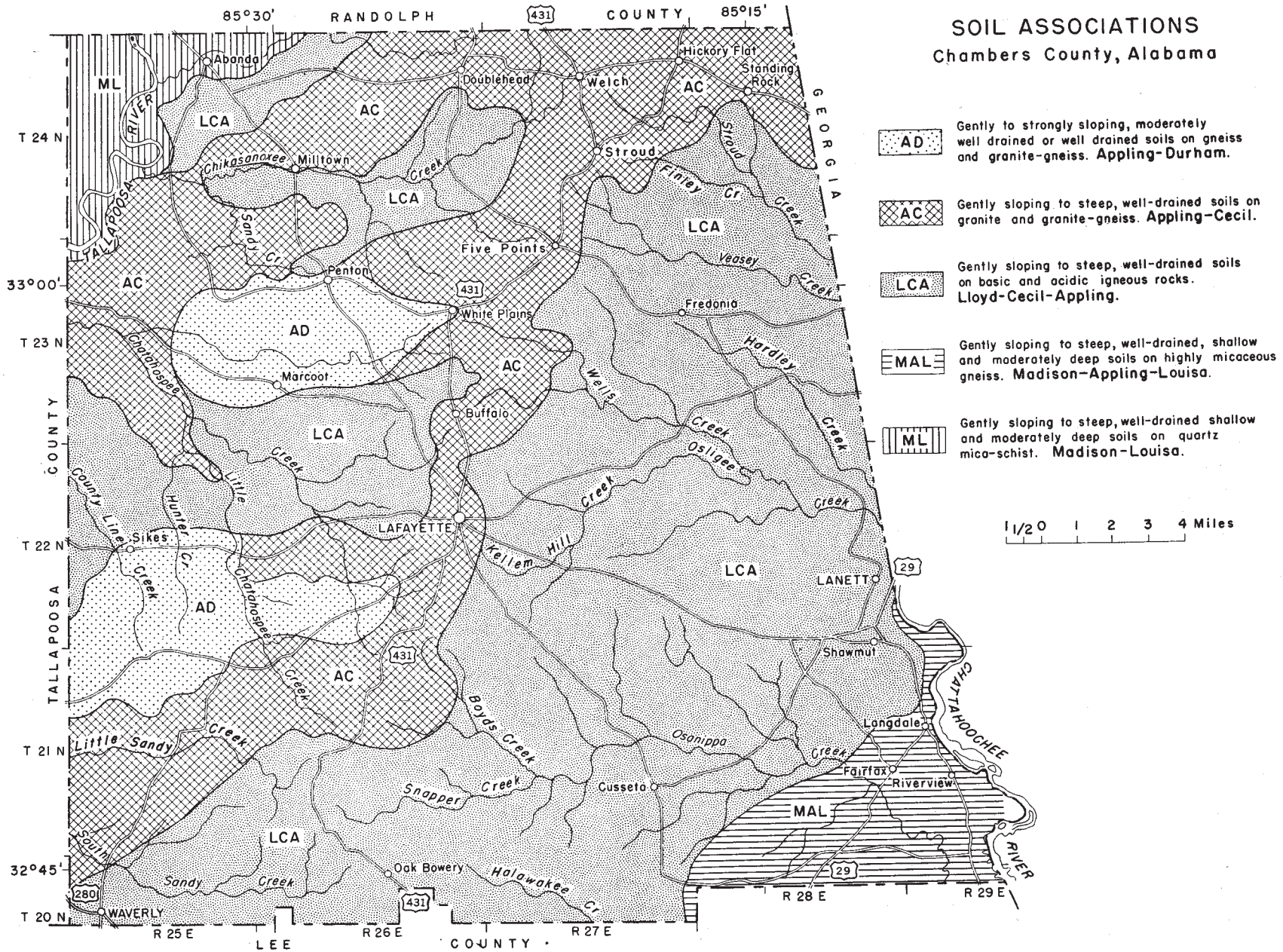

Figure 2.—**Soil associations of Chambers County, Alabama.**

About 40 percent of the association is wooded. The cleared acreage is divided as follows:

Use:	Percentage of cleared acreage
Cropland	70
Pasture	10
Idle land	20

Most of the gently sloping to sloping areas have been cleared. Although some strong slopes have been cleared, most of the strongly sloping or severely eroded areas have been withdrawn from production and are now in forest. Of the acreage cropped, a great part is in capability classes II, III, and IV, and much of the rest is in class VI.

Cotton, corn, and small grains—mainly oats and wheat—are the major crops grown. Much of the less sloping acreage is suited to these crops and responds well to good management. The severely eroded areas are not so suitable for cultivated crops but, if well managed, can be used for grasses and legumes grown for pasture. The strongly sloping and most severely eroded areas probably are best used for pine forest.

Appling-Cecil Association

This association is widely distributed on the gently sloping to steep upland. Much of the terrain is highly dissected. The parent rock is mainly granite and gneiss, which are acidic, but dikes and sills of basic rocks occur throughout the association. The soils are deep and well drained. They have a sandy loam surface soil and a clay loam to clay subsoil. Most of these soils are gravelly.

The association covers about 25 percent of the county. The acreage is distributed as follows:

Soil:	Percentage of total acreage
Appling and Cecil	60
Lloyd and Madison	20
Durham, Helena, Louisburg, and Colfax	10
Other (soils on flood plains of local alluvium and sandy alluvium)	10

About 30 percent of this association is in capability classes II and III. Some 40 percent is covered by capability class IV. About 20 percent is in capability class VI, and 10 percent is in capability class VII.

About 60 percent of the association is wooded, and much of this is in capability classes IV, VI, and VII. The remaining acreage, or about 50 percent of the association, is cleared. The cleared acreage, almost all in capability classes II, III, and IV, is used as follows:

Use:	Percentage of cleared acreage
Cropland	50
Pasture	40
Idle land	10

Severe erosion has reduced the agricultural potential of much of the land that was formerly cultivated. A great part of this now supports fair to good stands of loblolly and shortleaf pines.

Cotton, corn, and small grains, mainly oats and wheat, are the major crops grown on the less eroded areas, which respond well to good management. The severely eroded areas have poor tilth and workability and less available moisture-holding capacity.

Grasses and legumes can produce good pasture under good management. Kudzu and sericea lespedeza are best for the severely eroded and hilly areas. The very shallow or steep and severely eroded areas probably are best used as woodland.

Lloyd-Cecil-Appling Association

This soil association covers more acreage than any other in the county and contains much productive soil. It occurs on gently sloping to steep, highly dissected, broad, smooth upland. The parent rock is mainly diorite, hornblende, granodiorite, granite, and gneiss.

The less sloping parts of the association are deep and well drained; they have a sandy loam or loam surface soil and a clay loam or clay subsoil. Most of the soils in this association are gravelly. Stony and shallow areas are common, especially in the more sloping parts.

This association covers about 59 percent of the county. The acreage is distributed as follows:

Soil:	Percentage of total acreage
Lloyd	60
Cecil and Appling	20
Davidson, Mecklenburg, and Iredell	7
Other (alluvial soil on river flood plains)	13

Soils in capability classes II and III cover 20 percent of the acreage in this association. Class IV soils occupy about 40 percent, class VI soils account for 30 percent, and class VII soils are on the remaining 10 percent.

Of the total acreage, 40 percent is cleared and 60 percent is used as woodland. The cleared land is used as follows:

Use:	Percentage of cleared acreage
Cropland	45
Pasture	40
Idle land	15

The cultivated acreage consists mainly of soils in capability classes II, III, and IV. Most of the land under forest is in capability classes IV, VI, and VII.

The most intensive farming on this association is in the Fredonia and Cusseta communities. Cotton, corn, and small grains are the main cultivated crops wherever the association occurs. The gently sloping and sloping areas are well suited to these crops if erosion is not advanced. High yields can be expected under good management. Severely eroded areas generally have poor tilth and workability and less available moisture-holding capacity. They produce good pasture, however, under intensive management. Kudzu and sericea lespedeza are the best pasture and hay crops on severely eroded and hilly areas.

On much of the acreage that was formerly cultivated, the agricultural potential has been reduced by erosion. This acreage now has fair to good stands of loblolly and shortleaf pines.

Madison-Louisa Association

This association covers a small area in the northwestern corner of the county. The soils range from gently sloping to steep, but they are dominantly slop-

ing to steep. They are shallow to moderately deep, well-drained soils that have a sandy loam surface layer and a micaceous clay loam subsoil. The parent material is mainly mica schist, sericitic schist, and talcose schist. The stronger slopes have gravelly and stony areas. Much of the cleared acreage has been severely eroded.

This association occupies about 3 percent of the county. Approximately 20 percent of it consists of soils in classes II and III; 35 percent, soils in class IV; 35 percent, soils in class VI; and 10 percent, soils in class VII. The acreage is distributed approximately as follows:

Soil:	Percentage of total acreage
Madison and Louisa	65
Appling	10
Other	25

Listed under "Other" in the foregoing tabulation are soils of the terraces along the Tallapoosa River, mainly the Wickham, Hiwassee, and Altavista, as well as soils of the first bottoms, chiefly the Congaree, Buncombe, and Chewacla.

Of the total acreage in the association, about 70 percent is woodland, and 30 percent is cleared. The cleared acreage is divided as follows:

Use:	Percentage of cleared acreage
Cropland	40
Pasture	40
Idle land	20

The cultivated acreage consists mostly of soils in capability classes II, III, and IV. The woodland is in classes IV, VI, and VII.

Cotton, corn, and small grains are the chief crops. The gently sloping, less eroded soils are well suited to these crops. Yields are generally lower on the severely eroded areas, but grasses and legumes do well under good management. Sericea lespedeza and kudzu are best for the severely eroded and hilly parts. Some acreage that has been withdrawn from cultivation because of severe erosion and strong slopes now has fair to good stands of loblolly and shortleaf pines. Forest is probably best for the shallow, stony, severely eroded acreage.

Madison-Appling-Louisa Association

This association occupies a small area on gently sloping to steep relief in the southeastern corner of the county. The parent material is granite gneiss that contains much mica. The shallow to moderately deep well-drained soils of the association have a sandy loam surface soil and a micaceous clay loam subsoil. There are stony areas on the moderately steep and steep slopes and gravelly areas on all slopes. This association is similar to the Madison-Louisa association but is more gently sloping.

The association covers about 5 percent of the county. This acreage is divided as follows:

Soil:	Percentage of total acreage
Madison and Appling	60
Louisa	30
Other	10

The Madison and Louisa soils occur on deep, well-drained, gently sloping to sloping uplands. The stony and shallow Louisa soils are on the steeper slopes. Listed as "other" in the foregoing tabulation are soils on first bottoms along the Chattahoochee River, the Congaree, Buncombe, and Chewacla soils; and soils on high terraces, the Altavista, Hiwassee, and Wickham.

About 40 percent of the acreage in this association is in land capability classes II and III. Some 35 percent is occupied by capability classes IV and VI, and 25 percent is in class VII.

Of the total acreage in the association, about half has been cleared, and the other half is used as woodland. The cleared acreage is used as follows:

Use:	Percentage of cleared acreage
Cropland	60
Pasture	30
Idle land	10

The woodland is in land capability classes VI and VII. Most of the cultivated soil is in land capability classes II and III and, to a minor extent, in class IV. Most areas of the pasture and idle land are in capability classes III, IV, and VI.

Cotton, corn, and some small grain are the major crops grown. The gently sloping, less eroded acreage is well suited to these crops. Areas that have a greater degree of slope and erosion are more suited to grasses and legumes grown for pasture and hay. Kudzu and sericea lespedeza will grow where slope and erosion are extreme, but these areas are probably best suited to trees, especially loblolly and slash pines.

Use, Management, and Productivity of Soils

This section has three parts. The first explains the system of land-capability grouping used by the Soil Conservation Service. The second places all the soils of the county in capability units and suggests management for the soils in each unit. In the third part, estimated yields of principal crops are given for each soil under two levels of management.

Capability Groups

Capability grouping is a system of classification used to show the suitability of soils for crops, grazing, forestry, and wildlife. It is a practical grouping based on the needs and limitations of the soils, the risk of damage to them, and their response to management. There are three levels above the soil mapping unit. These are the capability unit, the subclass, and the class.

Unit.—The capability unit, which also can be called a management group of soils, is the lowest level of the capability grouping. A capability unit is made up of soils that are similar in the management they need, in the risk of damage, and in general suitability for use. In Chambers County, the soils have been placed in 15 capability units.

Subclass.—The next broader grouping, the subclass, is used to indicate the dominant kind of limitation. The letter symbol "e" indicates that the main limiting factor is risk of erosion; "w" means that there is excess

water or poor drainage; "s" means that the soils are shallow, droughty, or low in fertility; and "c" means that climate is so cold or dry it limits use of the soils. In this county only the "e" and "w" subclasses are used.

Class.—The broadest grouping, the land class, is identified by Roman numerals. All the soils in one class have limitations and management problems of about the same degree, but of different kinds as shown by the subclass. All of the land classes except class I may have one or more subclasses.

Eight broad classes are provided in the national capability classification, although not all these classes are in Chambers County.

Class I soils are those that have the widest range of use and the least risk of damage. They are level, or nearly level, productive, well drained, and easy to work. They can be cultivated with almost no risk of erosion and will remain productive if managed with normal care.

Class II soils can be cultivated regularly but do not have quite so wide a range of suitability as class I soils. Some class II soils are gently sloping; consequently, they need moderate care to prevent erosion. Other soils in class II may be slightly droughty, or slightly wet, or somewhat limited in depth.

Class III soils can be cropped regularly but have a narrower range of use than those in class II. They need even more careful management.

In class IV are soils that should be cultivated only occasionally or only under very careful management.

In classes V, VI, and VII are soils that normally should not be cultivated for annual or short-lived crops, but they can be used for pasture or range, for woodland, or for wildlife.

Class V soils (none in Chambers County) are nearly level and gently sloping but are droughty, wet, low in fertility, or otherwise not suitable for cultivation.

Class VI soils are not suitable for crops because they are steep or droughty or otherwise limited, but they give fair yields of forage or forest products. Some soils in class VI can, without damage, be cultivated enough so that fruit trees or forest trees can be set out or pasture crops seeded.

Class VII soils provide only poor to fair yields of forage and have characteristics that limit them severely for this use. Fair to good yields of forest products may be obtained.

Class VIII soils have practically no agricultural use. Some of them have value as watersheds, as wildlife habitats, or for scenery.

The capability classes, subclasses, and units that occur in Chambers County are given in the following list. The capability units are numbered according to the system used in the State of Alabama. Since all the units in the State are not represented in Chambers County, the unit numbers are not consecutive.

Class I.—Moderately deep to deep, nearly level, productive soils suitable for tilled crops and other uses; few or no permanent limitations.
- Unit I–1: Nearly level, well-drained soils on colluvial and local alluvial deposits.

Class II.—Soils that can be cultivated with only moderate risk of erosion or that have other moderate limitations if used for crops.
- Subclass IIe: Gently sloping soils that will erode if tilled and not protected.
  - Unit IIe–1: Gently sloping, red or brown, well-drained soils of the uplands and stream terraces.
  - Unit IIe–2: Gently sloping, yellowish-red or yellowish-brown soils.
- Subclass IIw: Soils moderately limited by excess water.
  - Unit IIw–2: Nearly level, moderately well drained or well drained soils of the flood plains.

Class III.—Soils that can be cultivated in a regular cropping system with moderately severe risk of erosion or that have other moderately severe limitations for cultivation.
- Subclass IIIe: Sloping or eroded soils.
  - Unit IIIe–1: Sloping, well-drained, red or brown soils of the uplands and stream terraces.
  - Unit IIIe–2: Sloping, yellowish-red or yellowish-brown soils of the uplands.
  - Unit IIIe–3: Gently sloping or sloping soils that have a slowly permeable subsoil.
  - Unit IIIe–12: Gently sloping and sloping, severely eroded, red or brown soils of the uplands.

Class IV.—Soils severely limited if used for crops that require tillage; suitable for pasture or trees.
- Subclass IVe: Soils severely limited by risk of erosion if not protected.
  - Unit IVe–1: Strongly sloping soils.
  - Unit IVe–2: Sloping soils that have a compact clay subsoil or are shallow over bedrock.
  - Unit IVe–5: Sloping or strongly sloping stony soils.
  - Unit IVe–10: Sloping, severely eroded soils.
- Subclass IVw: Soils severely limited for use as cropland because of excess water.
  - Unit IVw–1: Poorly drained soils of flood plains and stream terraces.

Class VI.—Soils too steep or stony for crops; suitable for pasture or trees with moderate limitations.
- Subclass VIe: Soils that will erode rapidly if not protected.
  - Unit VIe–2: Moderately steep or very severely eroded soils.

Class VII.—Soils severely limited for pasture; not suitable for cultivation.
- Subclass VIIe: Soils that will erode rapidly if not protected; not well suited to pasture.
  - Unit VIIe–1: Very severely eroded or gullied soils.
  - Unit VIIe–2: Rough, stony, strongly sloping or steep soils.

Class VIII.—Soils not suitable for crops, grazing, or woodland.
- Unit VIIIs–1: Rock land.

Management by Capability Units

In this subsection the soils of Chambers County are placed in capability units, and management is suggested for each unit. The suggestions are based on practices given in land capability guide sheets used by the Soil Conservation Service in Chambers County and on practices recommended in the Handbook of Alabama Agriculture (*2*)[1] and on recommendations of the Alabama Experiment Station. The table accompanying the

[1] Italic numbers in parentheses refer to Literature Cited, p. 53.

description of each capability unit gives the depth, subsoil permeability, drainage, available moisture-holding capacity, and inherent fertility of each soil in the unit. Except for the column on soil depth, all the columns in the tables are self-explanatory or are defined in the section, Soil Survey Methods. The column on depth refers to depth of the soil to bedrock, gravel, sand, clay, or other material that is notably different from the soil and that prevents or seriously retards growth of roots.

Specific kinds and amounts of fertilizer and amounts of lime are not suggested for the capability units. Soils should be tested to determine the amounts of lime and fertilizer needed. Local agricultural technicians, including those serving the Piedmont Soil Convation District, will be able to advise on the method of taking soil samples, shipment of the samples for analysis, and amounts of lime and fertilizer to apply for the soil tested and the crop to be grown. Generally, all the soils that have been used a number of years for crops and pasture will need complete fertilizer treatments.

In the capability units, the major emphasis is on management for production of cultivated crops, though it is realized that the individual operator may prefer to use the soils for pasture or forest. If pasture or forest is the choice, there are some general suggestions that will apply to all the soils.

Pastures on the soils of any of the capability units will normally need mowing to control weeds and brush. Pastures should not be overgrazed; a good cover of vegetation ought to be maintained at all times.

Any of the soils used for forest will need fire protection. Selective cutting should be practiced so that yields of highest quality and quantity can be harvested.

Capability unit I–1

This unit (table 1) consists of soils on colluvium and local alluvium in depressions at the heads of draws and at the bases of slopes. They are well-drained, moderately deep to deep soils on nearly level to gently sloping relief. The subsoils are permeable to roots and moisture. The limited acreage is made up of scattered plots 1 to 3 acres in size. The soils are acid to strongly acid and moderately to highly fertile.

Crops and practices.—These soils are suitable for all local row and forage crops and produce good yields. They also are suited to commercial forest, especially loblolly pine. Since they occur in small tracts, their management is generally the same as that of the surrounding acreage, although a few areas are fenced and planted to vegetables. The soils respond well to fertilizer and lime, but cover crops are needed to maintain their supply of organic matter. Terraces and ditches are needed on slopes above these soils to carry away water. Waterways crossing the soils of this group should be sodded.

Capability unit IIe–1

This unit (table 2) is made up of gently sloping, red or brown, well-drained soils of uplands that are shallow to deep. They have a moderate capacity to hold water that plants can use. Tilth is good and fertility is generally high. The soils are medium to strongly acid. The hazard of erosion is slight to moderate.

Crops and practices.—These soils are suitable for all local crops and produce good yields when fertilized. Grasses and legumes grown for pasture and hay do well if limed. Loblolly pine grows rapidly. Close-growing crops should cover the ground at least half of the time to help maintain organic matter and to prevent erosion. A suitable rotation is a row crop followed by a small grain and then annual lespedeza. A complete water-disposal system is needed that provides vegetated waterways in natural draws, terraces, and contour plowing, planting, and cultivation.

Capability unit IIe–2

This unit (table 3) consists of gently sloping, yellowish-red and yellowish-brown soils on the uplands and stream terraces. They are shallow to deep and moderately well drained to well drained. They are friable and sandy, moderate to low in fertility, and strongly acid. In this unit is Buncombe loamy sand, which occurs on small acreages and is sandier than the other soils of the unit. Erosion is not a hazard, but this soil is subject to occasional overflow. Workability is good where gravel does not interfere. The hazard of erosion is somewhat less than for the soils in unit IIe–1.

Crops and practices.—These soils are suitable for all local crops, including pasture and hay. Loblolly pine grows rapidly. The soils should be fertilized for good productivity, and lime is needed for legumes. A close-growing crop should cover the land at least half the time to maintain organic matter and fertility and to prevent erosion. A good rotation is a row crop followed by a small grain and annual lespedeza. Erosion should be controlled by vegetated waterways in natural draws, terraces, and contour plowing, planting, and cultivation.

On the Buncombe loamy sand, erosion is not a problem. Because of the rapid leaching of this soil by rainfall, small applications of fertilizer should be added frequently instead of using one heavy application.

TABLE 1.—*Soils of capability unit I-1 and some of their characteristics*

Soil	Slope	Soil depth	Subsoil permeability		Drainage	Available moisture capacity	Inherent fertility
			Upper part	Lower part			
	Percent	*Inches*					
Seneca sandy loam	0–6	21–36	Moderately rapid	Moderately rapid	Well drained	Moderate	Moderate.
Starr soils	0–6	24–42	Moderately rapid	Moderately rapid	Well drained	Moderate	High.

TABLE 2.—*Soils of capability unit IIe-1 and some of their characteristics*

Soil	Slope	Soil depth	Subsoil permeability		Drainage	Available moisture capacity	Inherent fertility
			Upper part	Lower part			
	Percent	*Inches*					
Cecil sandy loam, eroded gently sloping phase.	2–6	17–39	Moderately rapid	Moderate	Well drained	Moderate	High.
Cecil gravelly sandy loam, eroded gently sloping phase.	2–6	17–39	Moderately rapid	Moderate	Well drained	Moderate	High.
Davidson loam and clay loam, eroded gently sloping phase.	2–6	30–52	Moderately rapid	Moderately slow	Well drained	Moderate	High.
Lloyd sandy loam, eroded gently sloping phase.	2–6	18–36	Moderately rapid	Moderate	Well drained	Moderate	High.
Lloyd gravelly sandy loam, eroded gently sloping phase.	2–6	24–46	Moderately rapid	Moderate	Well drained	Moderate	High.
Madison gravelly fine sandy loam, eroded gently sloping phase.	2–6	26–50	Moderately rapid	Moderate	Well drained	Moderate	High.

TABLE 3.—*Soils of capability unit IIe-2 and some of their characteristics*

Soil	Slope	Soil depth	Subsoil permeability		Drainage	Available moisture capacity	Inherent fertility
			Upper part	Lower part			
	Percent	*Inches*					
Altavista fine sandy loam, gently sloping phase.	2–6	31–66	Moderate	Moderately slow	Moderately well drained.	Moderate	Moderate.
Appling sandy loam, gently sloping phase.	2–6	17–56	Moderate	Slow	Well drained	Moderate	Moderate.
Appling gravelly sandy loam, gently sloping phase.	2–6	17–56	Moderate	Slow	Well drained	Moderate	Moderate.
Durham sandy loam, gently sloping phase.	2–6	30–50	Moderate	Slow	Moderately well drained.	Moderate	Moderate.
Buncombe loamy sand	0–6	36–84	Rapid	Rapid	Well to excessively drained.	Low	Moderate to low.

TABLE 4.—*Soils of capability unit IIw-2 and some of their characteristics*

Soil	Slope	Soil depth	Subsoil permeability		Drainage	Available moisture capacity	Inherent fertility
			Upper part	Lower part			
	Percent	*Inches*					
Congaree loam	0–2	36–60	Rapid	Rapid	Well drained	Moderate	High.
Chewacla loam	0–2	36–60	Moderate	Moderate	Moderately well drained.	Moderate	High.
Chewacla sandy loam	0–2	36–60	Moderate	Moderate	Moderately well drained.	Moderate	High.

Capability unit IIw-2

This unit (table 4) consists of nearly level, moderately well drained or well drained soils of the flood plains. They are developing from alluvium along the larger streams and are flooded occasionally. The soils are deep, fertile, and strongly acid. Because the Chewacla soils have impaired internal drainage, they are less suitable for crops than the Congaree soil.

Crops and practices.—These soils are suitable for corn, sorghum, lespedeza, and vegetables. They also are well suited to fescue, dallisgrass, orchardgrass, whiteclover, lespedeza, and other grasses and legumes suitable for pasture. Most of the forested acreage is in water oak, gum, elm, hackberry, alder, and other water-tolerant growth. There are a few scattered pines in some areas.

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Although the soils are fertile, fertilizer is required for high yields. Lime is especially needed for legumes. Cover crops should be rotated with row crops to maintain organic matter. A good rotation is corn followed by Caley-peas. The peas should be allowed to reseed at least once every 2 years, and when they reseed, can be followed by grain sorghum. Since these soils are flooded frequently during the winter, the winter crops should have a high moisture tolerance.

Since spring rains often delay early planting, late-maturing crops are suggested. These soils should not be worked when too wet. Most places need a good drainage system that has diversion terraces to intercept water from the uplands and ditches to remove standing water. Hedgerows and similar obstructions should be removed to permit drainage without scouring.

In places the Chewacla soils are wet because of seepage from the stream channels. The channels need to be straightened and cleared of logs and debris to allow self-deepening of the channels.

Irrigation is practical on the soils of this group, since water is close and soil tilth and infiltration are favorable. Pastures respond readily to irrigation.

Capability unit IIIe–1

This unit (table 5) consists of sloping, well-drained, red or brown soils of the uplands and stream terraces. They are shallow to deep sandy loam to loam soils that are permeable to roots and moisture and have a moderate capacity to hold water that plants can use. Fertility is moderate to high, and workability is good where gravel is not excessive. The hazard of erosion is moderate to severe.

Crops and practices.—These soils are suitable for all local crops, pasture, and hay. Loblolly pine grows rapidly. If a row crop is to be planted, it should be rotated with a close-growing crop. This may be a 3-year rotation that keeps a cover crop on the ground two-thirds of the time, or a long-term rotation based on perennial grasses and legumes (fig. 3). Good examples are as follows: (1) First year, row crop; second year, small grain and lespedeza; third year, volunteer lespedeza; or (2) first 4 years, sericea lespedeza or other perennial; fifth year, row crop followed by a winter legume; and sixth year, row crop.

Although most of these soils have high fertility, fertilizer is needed on all crops. Most of the soils need lime, especially if legumes are grown. The soils are easy to work. A water-disposal system that provides vegetated waterways, terraces, and contour cultivation is needed.

Capability unit IIIe–2

This unit (table 6) consists of yellowish-red and yellowish-brown, sloping upland soils that are shallow to deep and well drained to moderately well drained. They are friable and sandy throughout the profile, moderately fertile, and strongly acid. These soils are easy to cultivate where gravel is not excessive. The hazard of sheet erosion is less than for the soils in unit IIIe–1.

Crops and practices.—These soils are suitable for all local crops, pasture, and hay. They are also suited to bahiagrass, which is not commonly grown at present, and coastal bermudagrass. Loblolly pine grows rapidly.

TABLE 5.—*Soils of capability unit IIIe-1 and some of their characteristics*

Soil	Slope	Soil depth	Subsoil permeability		Drainage	Available moisture capacity	Inherent fertility
			Upper part	Lower part			
	Percent	*Inches*					
Cecil sandy loam, eroded sloping phase.	6–10	17–39	Moderately rapid	Moderate	Well drained	Moderate	High.
Cecil gravelly sandy loam, eroded sloping phase.	6–10	17–39	Moderately rapid	Moderate	Well drained	Moderate	High.
Davidson loam, eroded sloping and strongly sloping phases.	6–15	30–52	Moderately rapid	Moderate	Well drained	Moderate	High.
Hiwassee fine sandy loam, eroded sloping phase.	6–10	24–60	Moderate	Moderately rapid	Well drained	Moderate	High.
Lloyd sandy loam, eroded sloping phase.	6–10	24–46	Moderately rapid	Moderate	Well drained	Moderate	High.
Lloyd gravelly sandy loam, sloping phase.	6–10	24–46	Moderately rapid	Moderate	Well drained	Moderate	High.
Lloyd gravelly sandy loam, eroded sloping phase.	6–10	24–46	Moderately rapid	Moderate	Well drained	Moderate	High.
Lloyd clay loam, severely eroded gently sloping phase.	2–6	18–36	Moderate	Moderate	Well drained	Moderate	High.
Madison gravelly fine sandy loam, eroded sloping phase.	6–10	26–50	Moderate	Moderate	Well drained	Moderate	High.
Madison soils, sloping graphitic phases.	6–10	16–32	Moderate	Moderate	Well drained	Moderate	High.
Wickham fine sandy loam, eroded sloping phase.	6–10	24–60	Moderate	Moderately slow	Well drained	Moderate	Moderate.

Figure 3.—**Sericea lespedeza on Lloyd sandy loam, eroded sloping phase.**

TABLE 6.—*Soils of capability unit IIIe-2 and some of their characteristics*

Soil	Slope	Soil depth	Subsoil permeability		Drainage	Available moisture capacity	Inherent fertility
			Upper part	Lower part			
	Percent	*Inches*					
Appling sandy loam, sloping phase.	6–10	17–56	Moderate	Slow	Well drained	Moderate	Moderate.
Appling gravelly sandy loam, sloping phase.	6–10	17–56	Moderate	Slow	Well drained	Moderate	Moderate.
Appling gravelly sandy clay loam, severely eroded gently sloping phase.	2–6	15–38	Moderate	Slow	Well drained	Moderate	Moderate.
Durham sandy loam, sloping phase.	6–10	30–50	Moderate	Slow	Moderately well drained.	Moderate	Moderate.

Fertilizer is required for good productivity, and lime is needed for legumes. Rotations should include close-growing crops at least two-thirds of the time to maintain organic matter and to prevent erosion. A 3-year rotation or a long-term rotation based on perennial grasses or legumes can be used. Good rotations are (1) first year, row crop; second year, oats and lespedeza; third year, volunteer lespedeza, or (2) first 4 years, sericea lespedeza; fifth year, row crop followed by a winter cover crop; and sixth year, row crop.

These soils need a complete water-disposal system that includes vegetated waterways, terraces, and contour cultivation.

Capability unit IIIe–3

This unit (table 7) consists of gently sloping or sloping soils that have slowly permeable subsoil. They are shallow to moderately deep and moderately well drained to imperfectly drained. Surface drainage ranges from slow to rapid, and the hazard of erosion is moderate to severe. The subsoil is heavy or compact and slowly permeable. The sandy loam surface soil is easy to work, although stones may interfere with machinery in some areas. Since these soils are wet by nature, they dry out slowly. They have moderate capacity to hold water that plants can use.

TABLE 7.—*Soils of capability unit IIIe-3 and some of their characteristics*

Soil	Slope	Soil depth	Subsoil permeability		Drainage	Available moisture capacity	Inherent fertility
			Upper part	Lower part			
	Percent	*Inches*					
Colfax sandy loam, gently sloping phase.	2–6	24–50	Moderate	Moderately slow	Imperfectly drained.	Moderate	Low.
Colfax sandy loam, gently sloping thick surface phase.	2–6	36–60	Moderate	Moderately slow	Imperfectly drained.	Moderate	Low.
Colfax sandy loam, sloping thick surface phase.	6–10	36–60	Moderate	Moderately slow	Imperfectly drained.	Moderate	Low.
Helena sandy loam, eroded sloping phase.	6–10	22–35	Slow	Slow	Moderately well drained.	Low	Low.
Iredell soils, eroded sloping phases.	6–10	16–29	Slow	Slow	Imperfectly drained.	Low	Low.

Crops and practices.—These soils are probably best suited to fescue, dallisgrass, johnsongrass, orchardgrass, bermudagrass, whiteclover, lespedeza, and similar plants grown for pasture and hay. Although they are not suitable for row crops, cotton and corn are often planted. Trees for timber, especially pine, make fair growth.

Row crops and pasture need fertilizer, and legumes need lime. A rotation that provides thick-growing cover two-thirds of the time is suggested for the cultivated areas. A suitable rotation is as follows: First and second years, ryegrass and crimson clover; third year, row crop followed by ryegrass and crimson clover. Caley-peas is a legume that provides good cover; it can be used instead of crimson clover.

Since these are imperfectly drained soils, spring rains may delay cultivation. A complete water-disposal system that includes vegetated waterways, terraces, and contour cultivation is needed.

Capability unit IIIe-12

This unit (table 8) consists of gently sloping and sloping, severely eroded, red or brown soils of the uplands. They are shallow to deep, well drained, and moderately permeable to roots and moisture; their capacity to hold water for plants is sufficient to produce most crops. The sandy clay to clay loam surface soil has poor tilth; little water infiltrates because most of the rainfall is lost in runoff. The hazard of erosion is severe.

Crops and practices.—Because of the severe hazard of erosion, these soils are less suitable for cultivation than those in unit IIIe–1. Nevertheless, the same kind of row crops and pasture plants can be grown. Loblolly pine grows rapidly.

A good rotation provides for a close-growing crop two-thirds of the time, or a long-term rotation based on perennial grasses can be used. Fertilizer is required for row crops and pasture, and lime is needed for legumes.

These soils are difficult to work. If they are cultivated when too wet, clods form that are hard to break when they dry. The seedbed often becomes crusted after a rain, and it is difficult to get a good stand because many seedlings cannot push through the crust. Tilth and workability can be improved by use of stable manure and green manure and by turning under crop residue. A water-disposal system that includes vegetated waterways, terraces, and contour cultivation is needed.

TABLE 8.—*Soils of capability unit IIIe-12 and some of their characteristics*

Soil	Slope	Soil depth	Subsoil permeability		Drainage	Available moisture capacity	Inherent fertility
			Upper part	Lower part			
	Percent	*Inches*					
Cecil gravelly clay loam, severely eroded gently sloping phase.	2–6	12–31	Moderate	Moderate	Well drained	Moderate	High.
Davidson clay loam, severely eroded sloping phase.	6–10	30–52	Moderate	Moderate	Well drained	Moderate	High.
Lloyd gravelly clay loam, severely eroded gently sloping phase.	2–6	18–36	Moderate	Moderate	Well drained	Moderate	High.
Madison clay loam, severely eroded gently sloping phase.	2–6	24–45	Moderate	Moderate	Well drained	Moderate	Moderate.

TABLE 9.—*Soils of capability unit IVe-1 and some of their characteristics*

Soil	Slope	Soil depth	Subsoil permeability		Drainage	Available moisture capacity	Inherent fertility
			Upper part	Lower part			
	Percent	*Inches*					
Appling gravelly sandy loam, strongly sloping phase.	10–15	15–40	Moderate	Slow	Well drained	Moderate	Moderate.
Cecil gravelly sandy loam, eroded strongly sloping phase.	10–15	15–31	Moderately rapid	Moderate	Well drained	Moderate	High.
Hiwassee fine sandy loam, eroded strongly sloping phase.	10–15	24–54	Moderate	Moderately rapid	Well drained	Moderate	High.
Lloyd gravelly sandy loam, strongly sloping phase.	10–15	24–46	Moderately rapid	Moderate	Well drained	Moderate	High.
Lloyd gravelly sandy loam, eroded strongly sloping phase.	10–15	15–30	Moderately rapid	Moderate	Well drained	Moderate	High.
Madison gravelly fine sandy loam, eroded strongly sloping phase.	10–15	26–42	Moderately rapid	Moderate	Well drained	Moderate	Moderate.
Madison soils, eroded strongly sloping graphitic phases.	10–15	15–28	Moderate	Moderate	Well drained	Moderate	Moderate.
Wickham fine sandy loam, eroded strongly sloping phase.	10–15	24–56	Moderate	Moderately slow	Well drained	Moderate	Moderate.

Capability unit IVe–1

This unit (table 9) consists of strongly sloping, well-drained sandy loam to loam soils that are shallow to deep to bedrock. Water enters the surface soil readily, but the capacity to hold water that plants can use is moderate. Sheet and gully erosion are a hazard because of the strong slopes. The fertility of these soils is moderate to high; they are medium acid to strongly acid. Stones in some areas interfere with the use of machinery.

Crops and practices.—These soils are best suited to kudzu, sericea lespedeza, and similar crops grown for hay and pasture. The soils are erodible and ought to be kept under close-growing crops three-fourths of the time. A practical rotation is sericea lespedeza for 3 or 4 years, followed by 1 year of a row crop. In this rotation, a row crop is planted at about the time the stand of sericea lespedeza thins out (fig. 4), and the cultivation necessary for the row crop leaves the soils in good condition for sowing lespedeza again.

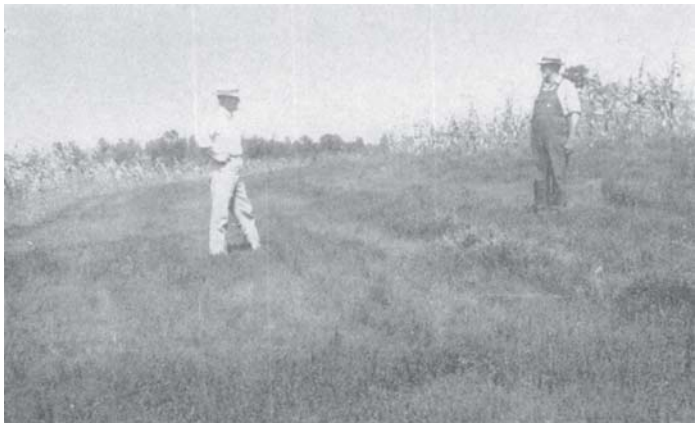

***Figure 4.*—Corn-lespedeza rotation in contour strips. This rotation is good when perennial lespedeza begins to thin out after a few years.**

Cotton, corn, some vegetables, and fruit trees are suited to these soils. Loblolly pine and farm forest are also suitable. Fertilizer is required for best production, and lime is needed for legumes.

If this soil is needed for row crops more often than once in 4 years, terraces should not be used because the slopes are too strong. More practical is the use of contour stripcropping that has alternate strips of row crops and sod crops.

Capability unit IVe–2

This unit (table 10) consists of sloping soils that have a compact or plastic clay subsoil or are shallow over bedrock. They are moderately well drained to well drained, and their capacity to hold water that plants can use is very low to moderate. Sheet and gully erosion are active. Stones and rock outcrops occur in many places.

Crops and practices.—These soils are best suited to sericea lespedeza, johnsongrass, bermudagrass, fescue, and similar plants grown for hay and pasture. A cover crop should be grown at least three-fourths of the time if the soils are used for row crops, for which they are poorly suited. A good rotation is as follows: Sericea lespedeza, which is turned under after 3 or 4 years, then 1 year of a row crop, and then perennial vegetation again. Some of the woodland is of low commercial value, but loblolly pine does well. Release cutting, or removal of large overtopping trees, is suggested where young pine stands are present.

Since these soils are moderate to low in fertility,

TABLE 10.—*Soils of capability unit IVe-2 and some of their characteristics*

Soil	Slope	Soil depth	Subsoil permeability		Drainage	Available moisture capacity	Inherent fertility
			Upper part	Lower part[1]			
	Percent	*Inches*					
Mecklenburg clay loam, severely eroded sloping phase.	6–10	24–38	Slow	Slow	Moderately well drained.	Moderate	Moderate.
Shallow land, sloping	6–10	5–12	Moderate to slow	----------	Well drained	Very low	Low.

[1] Dashed lines indicate rock.

fertilizer is needed, and lime is required for legumes. These heavy-textured soils are extremely difficult to work. If the soils are cultivated when too wet, clods form that are hard to break when they dry. Cultivation must be delayed longer after the spring rains than on the soils of capability unit IVe–1. In some places, stones hamper the use of mowers and other machinery.

If these soils are used for row crops, a complete water-disposal system is needed. Vegetated waterways should be established in natural draws. The waterways can be vegetated by the thick-growing crop used in the rotation. The thick-growing crop is left in the waterways when the soils are plowed for the row crops. Terraces are needed where practical, and all cultivation should be done on the contour.

Capability unit IVe–5

This unit (table 11) consists of sloping or strongly sloping stony soils that are shallow to moderately deep to bedrock. The stones interfere considerably with cultivation and may make it impractical. The soils are well drained but subject to sheet and gully erosion. They have a very low to moderate capacity to hold water that plants can use. The soils are low to moderate in fertility and strongly acid.

Crops and practices.—These stony, shallow, and rough soils are not suitable for cultivation, although some of the smoother areas with less stones can be used for row crops. The soils are suited to kudzu and sericea lespedeza grown for pasture, but probably their best use is for trees, especially loblolly pine.

If used for row crops, these soils should be planted to a thick-growing crop at least three-fourths of the time to prevent erosion and to maintain organic matter. Row crops should be planted in contour strips. A good cropping system is to put the soils in kudzu for 3 or 4 years; then the strips of kudzu are plowed out and planted to corn (fig. 5). After the last cultivation of the corn, the kudzu is allowed to grow over the cultivated strips.

Vegetated waterways should be established in natural draws by allowing the thick-growing crop to remain. Stones ought to be removed if mowers are to be used. Sericea lespedeza and kudzu are suitable crops, and the kudzu can be grazed without removing the stones. Fertilizer is needed on pasture and row crops for high yields.

Capability unit IVe–10

This unit (table 12) consists of sloping, severely eroded soils of sandy clay loam to clay loam texture that are shallow to deep, well drained, and permeable to roots and water. They have a low to moderate capacity to hold water that plants can use. The tilth is poor, and little water infiltrates because of the rapid surface runoff. Most of the acreage is severely eroded and difficult to work.

Crops and practices.—Organic matter should be increased to improve the tilth and workability in these soils. If the soils are cultivated when too wet, clods form that are hard to break when they dry. The seedbed tends to become encrusted after rains. The crust makes it difficult to establish a good stand. These soils need a complete water-disposal system that includes vegetated waterways, terraces, and contour cultivation.

TABLE 11.—*Soils of capability unit IVe-5 and some of their characteristics*

Soil	Slope	Soil depth	Subsoil permeability		Drainage	Available moisture capacity	Inherent fertility
			Upper part	Lower part[1]			
	Percent	*Inches*					
Appling stony sandy loam, sloping phase.	6–10	12–20	Moderate	----------	Well drained	Low	Low.
Lloyd stony sandy loam, strongly sloping phase.	10–15	14–28	Moderate	Moderate	Well drained	Moderate	Moderate.
Louisburg stony sandy loam, sloping phase.	6–10	4–12	Very rapid	----------	Well drained	Very low	Low.

[1] Dashed lines indicate rock.

TABLE 12.—*Soils of capability unit IVe-10 and some of their characteristics*

Soil	Slope	Soil depth	Subsoil permeability		Drainage	Available moisture capacity	Inherent fertility
			Upper part	Lower part			
	Percent	*Inches*					
Appling gravelly sandy clay loam, severely eroded sloping phase.	6–10	15–38	Moderate	Slow	Well drained	Low to moderate	Moderate.
Cecil gravelly clay loam, severely eroded sloping phase.	6–10	12–31	Moderately rapid	Moderate	Well drained	Low to moderate	Moderate.
Lloyd clay loam, severely eroded sloping phase.	6–10	18–36	Moderately rapid	Moderately slow	Well drained	Low to moderate	Moderate.
Lloyd gravelly clay loam, severely eroded sloping phase.	6–10	18–36	Moderately rapid	Moderately slow	Well drained	Low to moderate	Moderate.
Lloyd gravelly clay loam, severely eroded strongly sloping phase.	10–15	18–36	Moderately rapid	Moderately slow	Well drained	Low to moderate	Moderate.
Madison gravelly clay loam, severely eroded sloping phase.	6–10	24–45	Moderate	Moderate	Well drained	Low to moderate	Moderate.

***Figure 5.*—Kudzu-corn rotation on an Appling soil.**

Capability unit IVw–1

This unit (table 13) consists of poorly drained, deep to moderately deep soils of the flood plains and stream terraces. There are two soils in the unit: Worsham sandy loam, which has a sandy or silty surface soil and a slowly permeable sticky clay subsoil; and Sandy alluvial land, poorly to somewhat poorly drained, which has a high water table. These soils are wet much of the time and are occasionally flooded. Although they are not generally erodible, scouring occurs during flooding, and new soil material also is deposited. The soils are nearly level to depressional, strongly acid, and low in fertility.

Crops and practices.—These soils are not suitable for row crops. They are best suited to dallisgrass, whiteclover, and fescue grown for pasture. They can be used for trees, especially hardwoods. The soils provide habitats for beaver, muskrat, mink, and squirrel. Some farm ponds furnish water for livestock and irrigation and provide fishing.

Pastures require fertilizer and lime for high yields, and mowing is necessary to control weeds, alders, and other undesirable growth. A drainage system is needed to remove surface water. Little subsurface drainage is possible because of the high water table or unfavorable soil conditions. Channels should be straightened or deepened in places, and stream obstructions should be removed to decrease scouring and flooding.

Capability unit VIe–2

This unit (table 14) consists of moderately steep or very severely eroded upland soils that are so erodible they can be used only for permanent vegetation. They are shallow to deep, well drained, and moderately to slowly permeable to water. They have rapid to excessive surface runoff. The bare areas rapidly lose soil material through sheet and gully erosion. These soils are high to low in fertility and medium to strongly acid. Some areas are stony.

Crops and practices.—These soils are not suitable for row crops; they should be used for hay and pasture or trees. Kudzu and sericea lespedeza are best for hay and pasture, but cultivation should be held to a minimum in preparing a seedbed. Fertilizer is needed for good yields. Loblolly pine is best for woodland. In areas occupied mostly by hardwoods, the young pines in the stand can be given a chance to improve by cutting and girdling the low-value hardwoods.

TABLE 13.—*Soils of capability unit IVw-1 and some of their characteristics*

Soil	Slope	Soil depth	Subsoil permeability		Drainage	Available moisture capacity	Inherent fertility
			Upper part	Lower part[1]			
	Percent	*Inches*					
Sandy alluvial land, poorly to somewhat poorly drained.	0–2	Undifferentiated					
Worsham sandy loam	0–2	30–60	Slow	Very slow	Poorly drained	Low	Low.

[1] Dashed lines indicate rock.

TABLE 14.—*Soils of capability unit VIe-2 and some of their characteristics*

Soil	Slope	Soil depth	Subsoil permeability		Drainage	Available moisture capacity	Inherent fertility
			Upper part	Lower part			
	Percent	*Inches*					
Appling gravelly sandy loam, moderately steep phase.	15–25	15–36	Moderate	Slow	Well drained	Moderate	Low.
Appling gravelly sandy clay loam, severely eroded strongly sloping phase.	10–15	15–38	Moderate	Slow	Well drained	Low	Low.
Cecil gravelly sandy loam, eroded moderately steep phase.	15–25	12–31	Moderately rapid	Moderate	Well drained	Moderate	High.
Cecil gravelly clay loam, very severely eroded sloping phase.	6–10	12–24	Moderate	Moderate	Well drained	Low	Moderate.
Cecil gravelly clay loam, severely eroded strongly sloping phase.	10–15	12–28	Moderate	Moderate	Well drained	Low	Moderate.
Lloyd gravelly sandy loam, moderately steep phase.	15–25	20–30	Moderate	Moderately slow	Well drained	Moderate	High.
Lloyd stony sandy loam, moderately steep phase.	15–25	14–25	Moderate	Moderate	Well drained	Moderate	High.
Lloyd gravelly clay loam, very severely eroded sloping phase.	6–10	18–30	Moderate	Moderately slow	Well drained	Low	Moderate.
Lloyd gravelly clay loam, very severely eroded strongly sloping phase.	10–15	18–26	Moderate	Moderately slow	Well drained	Low	Moderate.
Lloyd gravelly clay loam, severely eroded moderately steep phase.	15–25	18–26	Moderate	Moderately slow	Well drained	Low	Moderate.
Madison gravelly fine sandy loam, moderately steep phase.	15–25	25–40	Moderate	Moderate	Well drained	Moderate	Moderate.
Madison gravelly clay loam, very severely eroded sloping phase.	6–10	22–40	Moderate	Moderate	Well drained	Low	Low.
Madison gravelly clay loam, severely eroded strongly sloping phase.	10–15	22–40	Moderate	Moderate	Well drained	Low	Low.
Madison gravelly clay loam, severely eroded moderately steep phase.	15–25	20–36	Moderate	Moderate	Well drained	Low	Low.

Capability unit VIIe–1

This unit (table 15) consists of very severely eroded or gullied soils. The soils are sloping to steep. All of the original surface soil and much of the subsoil have been lost through erosion. The soil profiles have been destroyed except in small areas between gullies. Much acreage is stony. These soils have a low capacity to hold water that plants can use. Fertility is low, and the soils are almost impossible to work. It is not practical to reclaim these soils by leveling.

TABLE 15.—*Soils of capability unit VIIe-1 and some of their characteristics*

Soil	Slope	Soil depth	Subsoil permeability		Drainage	Available moisture capacity	Inherent fertility
			Upper part	Lower part[1]			
	Percent	*Inches*					
Cecil gravelly clay loam, very severely eroded strongly sloping phase.	10–15	12–20	Moderate		Well drained	Low	Low.
Madison gravelly clay loam, very severely eroded strongly sloping phase.	10–15	20–30	Moderate	Moderate	Well drained	Low	Low.
Gullied land	6–25	Undifferentiated					

[1] Dashed lines indicate rock.

Crops and practices.—These soils are best suited to trees, although they may be planted to kudzu for pasture. The kudzu pasture must not be overgrazed, and fertilizer will be needed for sustained yields. The soils are too rough for mowing. Loblolly pine is best for areas to be reforested.

Capability unit VIIe-2

This unit (table 16) consists of rough, stony, strongly sloping, or steep soils. They are well drained and have rapid to excessive surface runoff. The subsoil is permeable, but shallow (8 to 24 inches deep to bedrock), strongly acid, and moderate to low in fertility. These soils are too rough and stony to cultivate or mow. They are subject to sheet and gully erosion unless good plant cover is maintained.

Crops and practices.—These soils are best suited to trees, especially loblolly pine. Kudzu may be used for grazing but should be managed so as to give complete ground cover at all times. The soils are too rough for mowing of hay crops. Loblolly pine is best for woodland. Where there are mixed stands of hardwoods and young pines, the pines should be encouraged by cutting the larger overtopping trees. Spot planting of pines may be needed in places.

TABLE 16.—*Soils of capability unit VIIe-2 and some of their characteristics*

Soil	Slope	Soil depth	Subsoil permeability		Drainage	Available moisture capacity	Inherent fertility
			Upper part	Lower part[1]			
	Percent	*Inches*					
Lloyd stony clay loam, severely eroded sloping phase.	6–10	14–24	Moderate		Well drained	Low	Moderate.
Lloyd stony clay loam, severely eroded strongly sloping phase.	10–15	14–21	Moderate		Well drained	Low	Moderate.
Lloyd gravelly clay loam, severely eroded sloping shallow phase.	6–10	12–20	Moderate		Well drained	Low	Moderate.
Lloyd gravelly clay loam, severely eroded strongly sloping shallow phase.	10–15	12–18	Moderate		Well drained	Low	Moderate.
Louisa gravelly sandy loam, moderately steep and steep phases.	15–25+	6–15	Moderate		Well drained	Low	Low.
Louisa stony sandy loam, steep phase.	25+	6–15	Moderate		Well drained	Low	Low.
Louisburg stony sandy loam, moderately steep and steep phases.	15–25+	4–12	Very rapid		Well drained	Very low	Low.
Rough broken land	2–25+	Undifferentiated					
Stony land	6–25	Undifferentiated					
Shallow land, strongly sloping.	10–15	4–9	Moderately rapid		Well drained	Very low	Low.
Talladega gravelly loam, moderately steep phase.	15–25	6–16	Moderately rapid		Well drained	Low	Low.

[1] Dashed lines indicate rock.

Capability unit VIIIs-1

This unit consists entirely of Rock land, which supports no vegetation except lichens and moss. It has no agricultural use, and gneiss is exposed over at least 75 percent of the surface. Coarse sand and rock fragments occur where the rock does not outcrop.

Crops and practices.—Redcedar or pine grows in the crevices and could be used for fence posts. Although no use has been made of the rock, it may have some potential value as building stone. This Rock land might be a recreational area, but it is not suitable for wildlife because it does not provide food and shelter.

Estimated Yields

Estimated average acre yields for the principal crops grown in the county are given in table 17. The estimates are at two levels of management. Yields in columns A result from the practices followed by most farmers in the county. Commercial fertilizers are used for cash crops, but a crop rotation that includes grass-legume mixtures is not systematically followed, and measures for control of water and erosion are not intensively applied.

Yields in columns B are based on practices suggested by the Alabama Agricultural Experiment Station and the Soil Conservation Service. The management needed to get the yields in columns B will include the suggestions given in the subsection, Management by Capability Units.

The yield estimates are based on field observations made by the survey party, information furnished by local farmers, and official agricultural records.

The Soils of Chambers County

This section provides information about soil series (groups of similar soils) and the mapping units. The first subsection gives some background information that the reader may need in the two subsections that follow. In the second subsection, the characteristics of the soil series are summarized. In the third, the soils shown on the soil map are described in detail.

Soil Survey Methods

The scientist who makes a soil survey examines soils in the field, classifies the soils in accordance with facts that he observes, and maps their boundaries on an aerial photograph or other map.

FIELD STUDY.—The soil surveyor bores or digs many holes to see what the soils are like. The holes are not spaced in a regular pattern but are located according to the lay of the land. Generally they are not more than a quarter of a mile apart, and sometimes they are much closer. In most soils such a boring or hole reveals several distinct layers, called *horizons*. Horizon A is the surface soil, horizon B is the subsoil, and horizon C is the substratum, or generally the parent material. Collectively the horizons are known as the *soil profile*. Each layer is studied to see how it differs from others in the profile and to learn the things about the soil that influence its capacity to support plant growth.

Color is usually related to the amount of organic matter. The darker the surface soil, as a rule, the more organic matter it contains. Streaks and spots of gray, yellow, and brown in the lower layers generally indicate poor drainage and poor aeration. Uniformly yellow, red, or brown lower layers generally indicate good drainage and aeration.

Texture, or the content of sand, silt, and clay, is determined by the way the soil feels when rubbed between the fingers and is later checked by laboratory analysis. Texture determines how well the soil retains moisture, plant nutrients, and fertilizer, and whether it is easy or difficult to cultivate.

Structure, which is the way the individual soil particles are arranged in larger grains and the amount of pore space between grains, provides clues to the ease or difficulty with which the soil is penetrated by plant roots and by moisture.

Consistence, or the tendency of the soil to crumble or to stick together, indicates whether it is easy or difficult to keep the soil open and porous under cultivation. Terms commonly used to describe consistence are brittle, compact, firm, friable, plastic, sticky, and stiff.

Other characteristics observed in the course of the field study and considered in classifying the soil include the following: The depth of the soil over bedrock or compact layers; the steepness and pattern of slopes; the degree of erosion; the nature of the parent material from which the soil has developed; and the acidity or alkalinity of the soil as measured by chemical tests.

CLASSIFICATION.—On the basis of the characteristics observed by the survey team or determined by laboratory tests, soils are classified into types, phases, and series. The soil type is the basic classification unit. A soil type may consist of several phases. Types that resemble one another in most of their characteristics are grouped into soil series.

Soil type.—Soils similar in kind, thickness, and arrangement of soil layers are classified as one soil type.

Soil phase.—Because of differences other than those of kind, thickness, and arrangement of layers, some soil types are separated into two or more phases. Slope variations, frequency of rock outcrops, degree of erosion, depth of soil over the substratum, or natural drainage are examples of characteristics that suggest dividing a soil type into phases.

The soil phase (or the soil type if it has not been subdivided) is the unit shown on the soil map. It is the unit that has the narrowest range of characteristics. Use and management practices, therefore, can be specified more easily than for soil series or yet broader groups that contain more variation.

Soil series.—Two or more soil types that differ in texture of the surface soil but are otherwise similar in kind, thickness, and arrangement of soil layers are normally designated as a soil series. In a given area, however, a soil series may be represented by only one soil type.

The name of a place where a soil series was first found is generally chosen for the name of the series. Thus, Chewacla is the name of a series of moderately well drained bottom-land soils that were first identified and mapped along Chewacla Creek in Lee County, Alabama.

TABLE 17.—*Estimated average acre yields of the principal crops on soils of Chambers County, Ala.*

[Yields in columns A are those to be expected under common management practices; those in column B, under good management practices.[1] Absence of yield indicates crop is not commonly grown on the soil at the level of management specified and is poorly suited to the soil]

Soil	Cotton lint		Corn		Oats		Lespedeza hay		Pasture	
	A	B	A	B	A	B	A	B	A	B
	Lb.	*Lb.*	*Bu.*	*Bu.*	*Bu.*	*Bu.*	*Tons*	*Tons*	*Cow-acre-days*[2]	*Cow-acre-days*[2]
Altavista fine sandy loam, gently sloping phase	200	375	25	50	25	55	0.6	1.5	125	250
Appling sandy loam:										
Gently sloping phase	250	425	30	50	30	60	1.0	2.0	110	215
Sloping phase	250	425	30	50	30	55	1.0	2.0	110	200
Appling gravelly sandy loam:										
Gently sloping phase	250	425	30	50	30	60	1.0	2.0	110	215
Sloping phase	250	425	30	50	30	55	1.0	2.0	110	200
Strongly sloping phase	225	375	30	50	25	50	1.0	2.0	100	190
Moderately steep phase	150	-------	18	-------	-------	-------	.8	1.8	80	150
Appling gravelly sandy clay loam:										
Severely eroded gently sloping phase	150	250	15	35	20	45	.8	2.0	75	150
Severely eroded sloping phase	150	250	15	35	20	40	.8	2.0	75	135
Severely eroded strongly sloping phase	125	-------	12	-------	15	-------	.7	1.6	60	125
Appling stony sandy loam, sloping phase	210	350	25	45	28	50	1.0	2.0	100	200
Buncombe loamy sand	125	200	15	40	25	55	-------	-------	90	150
Cecil sandy loam:										
Eroded gently sloping phase	275	450	30	55	30	60	1.2	2.5	125	260
Eroded sloping phase	275	450	30	55	30	60	1.2	2.5	125	260
Cecil gravelly sandy loam:										
Eroded gently sloping phase	275	450	30	55	30	60	1.2	2.5	125	260
Eroded sloping phase	275	450	30	55	30	60	1.2	2.5	125	260
Eroded strongly sloping phase	250	400	25	50	25	54	1.2	2.5	120	245
Eroded moderately steep phase	175	-------	20	-------	-------	-------	1.0	2.2	100	220
Cecil gravelly clay loam:										
Severely eroded gently sloping phase	200	375	18	40	25	50	1.2	2.5	110	225
Severely eroded sloping phase	200	375	18	40	25	48	1.2	2.4	110	210
Very severely eroded sloping phase	150	-------	15	-------	18	-------	.8	1.8	90	160
Severely eroded strongly sloping phase	150	-------	15	-------	18	-------	1.0	2.0	100	200
Very severely eroded strongly sloping phase	-------	-------	-------	-------	-------	-------	.5	1.0	50	100
Chewacla loam	-------	-------	40	75	-------	-------	-------	-------	180	280
Chewacla sandy loam	-------	-------	40	75	-------	-------	-------	-------	180	280
Colfax sandy loam:										
Gently sloping phase	-------	-------	10	25	-------	-------	-------	-------	80	150
Gently sloping thick surface phase	100	200	12	28	15	30	-------	-------	75	135
Sloping thick surface phase	100	200	12	28	15	30	-------	-------	75	135
Congaree loam	-------	-------	35	60	35	60	-------	-------	150	250
Davidson loam and clay loam, eroded gently sloping phase	300	500	30	60	40	75	1.5	3.0	200	280
Davidson clay loam, severely eroded sloping phase	275	425	25	55	35	70	1.5	3.0	160	260
Davidson loam, eroded sloping and strongly sloping phases	275	450	25	55	35	70	1.5	3.0	200	280
Durham sandy loam:										
Gently sloping phase	200	325	20	35	20	45	.7	1.2	90	150
Sloping phase	200	325	20	35	20	45	.7	1.2	90	150
Gullied land	-------	-------	-------	-------	-------	-------	.5	1.0	75	135
Helena sandy loam, eroded sloping phase	125	225	15	35	18	30	0	-------	75	140
Hiwassee fine sandy loam:										
Eroded sloping phase	250	400	30	60	35	65	1.5	3.0	180	250
Eroded strongly sloping phase	250	375	25	55	30	60	1.5	3.0	180	250
Iredell soils, eroded sloping phases	100	175	12	25	15	30	-------	-------	90	150
Lloyd sandy loam:										
Eroded gently sloping phase	275	450	30	60	38	70	1.4	2.8	160	250
Eroded sloping phase	275	450	30	60	38	70	1.4	2.8	160	250
Lloyd gravelly sandy loam:										
Eroded gently sloping phase	275	450	30	60	38	70	1.4	2.8	160	250
Sloping phase	275	450	30	60	38	70	1.4	2.8	160	250
Eroded sloping phase	275	450	30	60	38	70	1.4	2.8	160	250
Strongly sloping phase	250	400	25	55	35	60	1.4	2.8	140	225
Eroded strongly sloping phase	250	400	25	55	35	60	1.4	2.8	140	225
Moderately steep phase	200	-------	20	-------	-------	-------	1.2	2.7	130	215
Lloyd gravelly clay loam:										
Severely eroded gently sloping phase	240	400	25	45	35	60	1.2	2.5	130	225
Very severely eroded sloping phase	175	-------	18	-------	20	-------	1.0	2.0	100	180
Severely eroded sloping phase	240	400	25	45	35	60	1.2	2.5	130	225
Severely eroded strongly sloping phase	200	350	22	40	25	45	1.0	2.0	120	200
Very severely eroded strongly sloping phase	150	-------	15	-------	18	-------	.7	1.5	80	150
Severely eroded moderately steep phase	150	-------	15	-------	18	-------	.7	1.5	100	180

Footnotes at end of table.

TABLE 17.—*Estimated average acre yields of the principal crops on soils of Chambers County, Ala.*—Continued

Soil	Cotton lint		Corn		Oats		Lespedeza hay		Pasture	
	A	B	A	B	A	B	A	B	A	B
	Lb.	*Lb.*	*Bu.*	*Bu.*	*Bu.*	*Bu.*	*Tons*	*Tons*	*Cow-acre-days*[2]	*Cow-acre-days*[2]
Lloyd clay loam:										
Severely eroded gently sloping phase	240	400	25	45	35	60	1.2	2.5	130	225
Severely eroded sloping phase	240	400	25	45	35	60	1.2	2.5	130	225
Lloyd stony sandy loam:										
Strongly sloping phase	200	340	20	45	30	50	1.2	2.4	140	225
Moderately steep phase	150	-------	15	-------	-------	-------	1.0	2.0	100	190
Lloyd stony clay loam:										
Severely eroded sloping phase	175	-------	18	-------	-------	-------	1.2	2.4	120	200
Severely eroded strongly sloping phase	150	-------	15	-------	-------	-------	1.0	2.0	100	190
Lloyd gravelly clay loam:										
Severely eroded sloping shallow phase	175	-------	18	-------	20	-------	.8	1.5	90	170
Severely eroded strongly sloping shallow phase	150	-------	15	-------	-------	-------	.6	1.1	80	150
Louisa gravelly sandy loam, moderately steep and steep phases	-------	-------	-------	-------	-------	-------	.5	1.0	75	140
Louisa stony sandy loam, steep phase	-------	-------	-------	-------	-------	-------	.5	1.0	75	140
Louisburg stony sandy loam:										
Sloping phase	-------	-------	-------	-------	-------	-------	-------	-------	50	80
Moderately steep and steep phases	-------	-------	-------	-------	-------	-------	-------	-------	50	80
Madison gravelly fine sandy loam:										
Eroded gently sloping phase	275	450	30	55	30	60	1.2	2.5	125	260
Eroded sloping phase	275	450	30	55	30	60	1.2	2.5	125	260
Eroded strongly sloping phase	230	400	25	45	25	50	1.2	2.5	110	240
Moderately steep phase	200	-------	20	-------	-------	-------	1.0	2.0	90	190
Madison gravelly clay loam:										
Severely eroded sloping phase	240	370	25	45	25	50	1.2	2.5	100	220
Very severely eroded sloping phase	175	-------	18	-------	20	-------	.8	1.5	80	160
Severely eroded strongly sloping phase	200	300	20	35	20	40	1.0	2.0	90	200
Very severely eroded strongly sloping phase	125	-------	15	-------	15	-------	.7	1.5	75	140
Severely eroded moderately steep phase	-------	-------	-------	-------	-------	-------	.7	1.5	75	150
Madison clay loam, severely eroded gently sloping phase	240	375	25	45	25	50	1.2	2.5	100	220
Madison soils:										
Sloping graphitic phases	250	375	25	50	30	55	1.0	2.0	125	250
Eroded strongly sloping graphitic phases	200	325	25	50	30	50	1.0	2.0	110	230
Mecklenburg clay loam, severely eroded sloping phase	200	350	20	45	25	50	.8	1.5	140	200
Rock land	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------
Rough broken land	-------	-------	-------	-------	-------	-------	-------	-------	50	90
Stony land	-------	-------	-------	-------	-------	-------	-------	-------	50	90
Sandy alluvial land, poorly to somewhat poorly drained	-------	-------	-------	-------	-------	-------	-------	-------	100	180
Seneca sandy loam	225	400	30	50	30	60	1.0	2.0	110	215
Shallow land:										
Sloping	-------	-------	-------	-------	-------	-------	-------	-------	60	110
Strongly sloping	-------	-------	-------	-------	-------	-------	-------	-------	60	110
Starr soils	275	500	30	60	35	70	1.5	3.0	160	250
Talladega gravelly loam, moderately steep phase	-------	-------	-------	-------	-------	-------	.5	1.0	60	125
Wickham fine sandy loam:										
Eroded sloping phase	275	450	30	60	30	60	1.2	2.5	125	260
Eroded strongly sloping phase	250	400	25	50	25	55	1.2	2.5	120	245
Worsham sandy loam	-------	-------	-------	-------	-------	-------	-------	-------	80	150

[1] For yields in columns B, adequate artificial drainage is assumed for all soils capable of responding.

[2] Cow-acre-days is the number of days 1 acre will graze a mature animal (cow, horse, or steer) without injury to the pasture, and without supplemental feeding.

Soil series are correlated and kept standard across county and State lines. For example, the Cecil soils in Chambers County are similar in every way to the Cecil soils as mapped in other States.

Miscellaneous land types.—The land types are not classified into series but are identified by descriptive names such as Gullied land, Rock land, Rough broken land, Shallow land, Stony land, and Sandy alluvial land, poorly to somewhat poorly drained.

Classes of slopes.—There are six classes, by soil slope gradient, in Chambers County:

Names	*Limits*
Nearly level	0 to 2 percent
Gently sloping	2 to 6 percent
Sloping	6 to 10 percent
Strongly sloping	10 to 15 percent
Moderately steep	15 to 25 percent
Steep	25 + percent

Phases of erosion by water.—Three degrees of erosion are represented in the county by phase names. If no phase name is assigned, erosion is insignificant.

Eroded: From 25 to 75 percent of the original surface layer has been lost; there may be a few shallow gullies.

Severely eroded: From 75 percent to all of the original surface layer has been lost; a few shallow or deep gullies may be present.

Very severely eroded: All of the original surface layer and up to 25 percent of the upper subsoil have been lost; a few shallow or deep gullies may be present.

Sheet and gully erosion are frequently mentioned in this report. Sheet erosion is the removal of a more or less uniform layer from the land surface. Gully erosion is a type of accelerated erosion that produces deep channels that cannot be smoothed out by normal tillage.

DEFINITIONS.—Other terms used in this report are defined as follows:

Alluvial soils.—An azonal group of soils that are developing from transported and rather recently deposited alluvium. In these soils there has been little or no modification of the original material by soil-forming processes.

Alluvium.—Sand, mud, and other sediments deposited on land by streams.

Available moisture-holding capacity.—The ability of soils to hold water that can be used by plants at rates significant to their growth.

Bedrock.—The solid rock underlying soils.

Colluvium.—Mixed deposits of soil material and rock fragments near the base of rather steep slopes. The deposits have accumulated through soil creep, slides, and local wash.

Fertility, soil.—The inherent quality of a soil that enables it to provide compounds, in adequate amounts and in proper balance, for the growth of plants.

First bottom.—The normal flood plain of a stream, subject to frequent or occasional flooding.

Great soil group.—Any one of several broad groups of soils with fundamental characteristics in common.

Permeability, soil.—The quality of a soil horizon that enables water or air to move through it.

Productivity, soil.—The capacity of a soil to produce specified plants under a defined set of management practices.

Reaction, soil.—The degree of acidity or alkalinity of a soil mass, expressed in either pH value or in words, as follows (*5*):

	pH		*pH*
Extremely acid	below 4.5	Slightly acid	6.1–6.5
Very strongly acid	4.5–5.0	Neutral	6.6–7.3
Strongly acid	5.1–5.5	Mildly alkaline	7.4–8.0
Medium acid	5.6–6.0		

Residuum.—Remnants of rock formation left after weathering in place.

Sills.—Intrusive sheets of igneous rock.

Soil.—The natural medium for the growth of land plants on the surface of the earth.

Subsoil.—Technically, the B horizon; commonly, that part of the profile below plow depth.

Substratum.—Material underlying the subsoil. The term is applied both to parent materials and to other layers unlike the parent material that are below the B horizon, or subsoil.

Surface soil.—Technically, the A horizon; commonly, that part of the upper profile generally stirred by plowing.

Terrace (geological).—An old alluvial plain, generally level or smooth, bordering a stream; it is seldom subject to overflow. Frequently, a terrace is called a second bottom.

Soil Series and Their Relations

The soil types of Chambers County have been classified in 22 series on the basis of differences in characteristics (table 18). To show their relations more clearly, the series are placed in three groups according to their position on the landscape: (1) Soils of the uplands, (2) soils of stream terraces, and (3) soils of alluvial and colluvial lands.

Soils of the uplands lie just above the adjacent stream bottoms and were derived directly through the decomposition and weathering of underlying rocks. Soils of stream terraces consist of old waterborne material on benchlike areas between bottom lands and uplands. They are not subject to flooding.

Soils of the alluvial and colluvial lands are young or immature. They are still in the process of developing and have not been in place long enough to have a well-defined profile. In this group are the Congaree, Buncombe, and Chewacla soils, which were formed from alluvium and are subject to stream overflow, and the Starr, Seneca, and Worsham soils, which have formed from local alluvium and colluvium in depressions and at the heads of draws and are not subject to flooding.

In addition to the soil series, the following miscellaneous land types were mapped:

Sandy alluvial land, poorly to somewhat poorly drained.
Gullied land.
Stony land.
Rough broken land.
Rock land.
Shallow land.

TABLE 18.—*Major characteristics of the soil*

Soil series	Parent material	Drainage class	Depth[1] of profile	Surface soil	
				Color[2]	Texture
			Inches		
SOILS OF					
Appling	Granite and gneiss	Well drained	12–56	Light brownish gray	Sandy loam
Cecil	Granite and gneiss	Well drained	12–39	Brown to dark brown	Sandy loam
Colfax	Granite and gneiss	Imperfectly drained	24–50	Pale olive to dark grayish brown.	Coarse sandy loam to sandy loam.
Davidson	Hornblende and diorite	Well drained	30–52	Dark red to dark reddish brown.	Loam or clay loam
Durham	Granite and gneiss	Well to moderately well drained.	30–50	Dark grayish brown	Sandy loam
Helena	Mixed acidic and some basic rock.	Moderately well drained	22–35	Light gray	Sandy loam
Iredell	Hornblende gneiss and chloritic schist.	Imperfectly drained	16–29	Olive	Sandy loam
Lloyd	Mixed acidic and basic rock	Well drained	5–33+	Dark reddish brown	Sandy loam
Louisa	Mica schist and quartz mica schist.	Well drained	6–15	Brown to reddish brown	Sandy loam
Louisburg	Granite and gneiss	Well drained	4–12	Light gray to light brownish gray.	Sandy loam
Madison	Mica, quartz mica schist, graphitic schist, and gneiss.	Well drained	16–50	Brown to reddish brown	Fine sandy loam and clay loam.
Mecklenburg	Diorite, gabbro, and hornblende schist.	Moderately well drained	24–38	Yellowish red to reddish brown.	Clay loam to loam or sandy loam.
Talladega	Sericitic schist, graphitic schist, and quartzite.	Well drained	6–16	Brown to reddish brown	Sandy loam
SOILS OF STREAM					
Altavista	Old Piedmont alluvium	Moderately well drained	31–66	Grayish brown to light yellowish brown.	Fine sandy loam
Hiwassee	Old Piedmont alluvium	Well drained	24–60	Dark brown	Fine sandy loam
Wickham	Old Piedmont alluvium	Well drained	24–60	Brown	Fine sandy loam
SOILS OF ALLUVIAL					
Buncombe	Piedmont alluvium	Well drained to excessively drained.	36–84	Brown	Loamy sand
Chewacla	Piedmont alluvium	Moderately well drained	36–60	Yellowish red to light yellowish brown.	Loam to sandy loam
Congaree	Piedmont alluvium	Well drained	36–60	Brown	Loam to sandy loam
Seneca	Local alluvium originating from light-colored Piedmont material.	Well drained	21–36	Light yellowish brown	Sandy loam
Starr	Local alluvium and colluvium originating from dark-colored Piedmont material.	Well drained	24–42	Dark reddish brown, brown, and dark red.	Loam, very fine sandy loam, and clay loam.
Worsham	Local alluvium and colluvium originating from light-colored Piedmont material (mainly granite, gneiss, and schist).	Poorly drained	25–40	Light yellowish brown	Sandy loam

[1] Depth to bedrock, bed of gravel, or other material significantly different from that in the soil profile.

[2] Color of soil when moist; terms used conform with those in the Munsell system of expressing soil colors.

series of Chambers County

UPLANDS

Surface soil		Subsoil			Reaction	Slope range
Consistence [3]	Thickness	Color [2]	Texture	Consistence [3]		
	Inches					*Percent*
Very friable	5–12	Yellowish red	Sandy clay	Friable	Strongly acid	2–25
Very friable	5–12	Dark red	Sandy clay	Friable to firm	Strongly acid	2–25
Very friable	6–21	Pale yellow to yellowish brown.	Sandy clay loam	Friable	Strongly acid	1–10
Friable	6–12	Dark red	Clay	Friable to firm	Medium acid	2–15
Very friable	6–16	Yellowish brown	Sandy clay	Friable	Strongly acid	2–10
Very friable	3–6	Yellowish brown	Sandy clay	Firm	Strongly acid	2–10
Friable	3–12	Light olive brown	Clay	Very firm	Strongly acid	2–10
Friable	6–10	Dark red	Sandy clay to clay loam	Friable to firm	Medium acid	2–25+
Very friable	4–10	Yellowish red	Sandy clay loam	Very friable	Strongly acid	10–25+
Very friable	4–10	Yellowish brown to pale yellow.	Sandy clay	Friable	Strongly acid	6–25+
Very friable	4–9	Dark red	Clay loam to clay	Friable to firm	Strongly acid	2–25+
Firm to friable	5–8	Red	Clay	Firm	Medium acid	6–10
Very friable	6–12	Strong brown to red	Sandy loam to sandy clay loam.	Very friable to friable	Strongly acid	6–25
TERRACES						
Very friable	4–10	Yellowish brown	Sandy clay loam to sandy clay.	Friable to firm	Strongly acid	0–10
Very friable	3–8	Dark red	Clay	Friable to firm	Strongly acid	2–15
Friable	5–11	Red	Sandy clay loam to clay.	Friable to firm	Strongly acid	1–15
AND COLLUVIAL LANDS						
Very friable	10–16	Strong brown	Loamy sand	Very friable	Strongly acid	0–2
Very friable to friable	7–15	Yellowish red	Sandy loam to loam	Friable to very friable	Strongly acid	0–2
Friable	8–16	Strong brown to yellowish brown.	Fine sandy clay loam	Very friable	Strongly acid	0–2
Very friable	12–21	Yellowish brown	Sandy clay loam	Friable	Strongly acid	0–6
Friable	24–36	Dark reddish brown	Sandy loam	Very friable	Medium acid	0–6
Very friable	6–13	Gray and yellow	Clay	Friable	Strongly acid	0–6

[3] Consistence when moist.

Soil Series, Types, and Phases

In the following pages the soil types and phases of Chambers County are described in detail and their use for agriculture is discussed. The soils are listed in alphabetical order by series name and are identified by the same symbols as those shown on the soil map in the back of this report. The soil map shows the location and distribution of all the soils. The acreage and proportionate extent of the soils mapped are given in table 19. For meaning of special terms used in the soil descriptions see the definitions under the heading, Soil Survey Methods.

Altavista series

The Altavista series consists of moderately deep to deep, moderately well drained soils on low stream terraces. The soils have developed in old alluvium washed mainly from soils of the upland Piedmont Plateau. They are on nearly level to sloping topography along the Tallapoosa and Chattahoochee Rivers and some of the larger creeks. Associated with these soils are the better drained, higher lying Wickham soils on the red stream terraces and the lower lying Congaree and Buncombe soils on the flood plains.

Altavista soils have grayish-brown to light yellowish-brown friable fine sandy loam surface soil and yellowish-brown friable to firm sandy clay loam to sandy clay subsoil. Permeability is moderate to moderately slow, and the profile is strongly acid. The series is in the Red-Yellow Podzolic great soil group. One soil of the Altavista series is mapped in the county.

Altavista fine sandy loam, gently sloping phase (2 to 6 percent slopes) (AaB).—The following describes a profile of this soil in a cultivated area:

0 to 10 inches, light yellowish-brown very friable fine sandy loam.
10 to 26 inches, yellowish-brown friable sandy clay loam; breaks easily to fine and medium subangular blocky pieces.
26 to 36 inches, light olive-brown friable to firm sandy clay mottled with yellowish brown and strong brown; breaks easily to fine and medium subangular blocky pieces.
36 to 48 inches, highly mottled yellowish-brown, olive-yellow, red, strong-brown, and gray sandy clay; massive (structureless); friable to firm.
48 to 58 inches +, unconsolidated to weakly cemented gravel beds.

The profile is 31 to some 66 inches deep to the gravel beds. In many places the subsoil contains mica flakes. In other places the profile rests on residual material from underlying rock instead of on gravel beds. Some of the acreage has rounded quartz gravel, 1 to 3 inches in diameter, scattered over the surface and imbedded in the profile.

Included with this mapping unit is a small nearly level to sloping acreage, some areas with slopes of 6 to 10 percent, and moderately eroded areas of some size. These eroded areas have a 4- to 6-inch fine sandy loam surface soil and generally are on the stronger slopes.

This soil has medium surface runoff, medium internal drainage, and moderate available moisture-holding capacity. It is moderate in fertility, low in organic matter, and medium to strongly acid.

Use and management.—Most of the acreage has been cleared. The native vegetation was water oak, hickory, dogwood, and other hardwoods. Approximately 75 percent of the acreage is in crops and pasture. Because risk of erosion is moderate, this soil needs a rotation that keeps thick-growing crops on it half of the time. It also needs contour cultivation and a complete system for disposing of water, including sodded waterways. The impaired or slow drainage in the lower subsoil somewhat limits the suitability of the soil for most deep-rooted crops. Nevertheless, the soil will produce most crops grown in the county, including grasses and legumes for hay or pasture. Medium to high yields can be expected under good management. Capability unit IIe–2.

Appling series

The Appling series consists of shallow to deep, well-drained soils that developed on the Piedmont upland from granite and gneiss. These gently sloping to moderately steep soils occur over most of the county. They are associated with soils of the Cecil and Lloyd series, which tend to be a deeper red; with the Durham, which are more yellowish; and with the shallow, poorly developed Louisburg soils.

Appling soils have a light brownish-gray friable sandy loam surface soil and a yellowish-red friable sandy clay subsoil. They are strongly acid. These soils are in the Red-Yellow Podzolic great soil group.

In the northwestern part of the county, the Appling soils have developed from a mixture of gneiss and quartz mica schist. In this part they are associated with the micaceous Madison soils. In many other parts of the county, Appling soils form an intricate pattern with Cecil, Lloyd, and Durham soils because the geologic formations are highly mixed. In these areas, which cover only a small percentage of the county, the boundaries shown on the soil map are only approximate.

Most of the acreage has been cleared and is in row crops and pasture. The native vegetation was hardwoods and pine. Some areas that were once cleared have been abandoned. They now support fair to good mixed stands of pine.

Appling sandy loam, gently sloping phase (2 to 6 percent slopes) (AdB).—The following describes a profile of this soil in a cultivated area:

0 to 6 inches, light brownish-gray very friable sandy loam.
6 to 10 inches, light yellowish-brown very friable sandy loam.
10 to 29 inches, yellowish-red friable sandy clay that easily breaks to subangular blocky pieces.
29 to 45 inches, yellowish-red friable sandy clay highly mottled with red and yellowish brown; breaks easily to subangular blocky pieces.
45 to 50 inches, yellowish-red to red, firm, massive sandy clay that is highly mottled with red, yellow, and yellowish brown; gradual transition to partially weathered granite and gneiss.

The profile is 17 to 56 inches deep to the massive clay. Included is a small acreage that is nearly level, and a small acreage that has a strong-brown to yellowish-red, heavy, tough clay subsoil with many red mottles.

This soil is permeable to roots and moisture and has moderate available moisture-holding capacity. Tilth is good, and the soil is easily worked and con-

TABLE 19.—*Acreage by land use, total acreage, and proportionate extent of the soils mapped*

Soil	Cultivated	Woodland	Idle	Permanent pasture	Total area	Proportionate extent
	Acres	*Acres*	*Acres*	*Acres*	*Acres*	*Percent*
Altavista fine sandy loam, gently sloping phase	393	204	128	110	835	0.2
Appling sandy loam:						
Gently sloping phase	1,887	200	161	122	2,370	.6
Sloping phase	1,279	333	169	127	1,908	.5
Appling gravelly sandy loam:						
Gently sloping phase	4,386	452	459	392	5,689	1.5
Sloping phase	14,083	5,965	2,854	1,572	24,474	6.4
Strongly sloping phase	1,232	5,640	568	220	7,660	2.0
Moderately steep phase	41	956	9	11	1,017	.3
Appling gravelly sandy clay loam:						
Severely eroded gently sloping phase	521	338	98	140	1,097	.3
Severely eroded sloping phase	7,885	4,607	2,940	1,347	16,779	4.4
Severely eroded strongly sloping phase	2,972	6,922	2,069	575	12,538	3.3
Appling stony sandy loam, sloping phase	169	196	59	22	446	.1
Buncombe loamy sand	89	264	97	73	523	.1
Cecil sandy loam:						
Eroded gently sloping phase	453	62	39	42	596	.2
Eroded sloping phase	414	1,564	159	24	2,161	.6
Cecil gravelly sandy loam:						
Eroded gently sloping phase	2,645	322	508	233	3,708	1.0
Eroded sloping phase	4,766	3,050	1,181	551	9,548	2 5
Eroded strongly sloping phase	201	3,745	175	141	4,262	1.1
Eroded moderately steep phase	8	1,327	20	16	1,371	.4
Cecil gravelly clay loam:						
Severely eroded gently sloping phase	1,471	354	490	264	2,579	.7
Severely eroded sloping phase	11,936	9,053	4,352	2,139	27,480	7.2
Very severely eroded sloping phase	119	262	111	45	537	.1
Severely eroded strongly sloping phase	1,762	11,225	1,504	658	15,149	4.0
Very severely eroded strongly sloping phase	167	531	83	62	843	.2
Chewacla loam	262	536	75	243	1,116	.3
Chewacla sandy loam	967	3,230	490	814	5,501	1.4
Colfax sandy loam:						
Gently sloping phase	113	142	79	47	381	.1
Gently sloping thick surface phase	195	72	80	8	355	.1
Sloping thick surface phase	81	51	27	23	182	(1)
Congaree loam	335	283	98	183	899	.2
Davidson loam and clay loam, eroded gently sloping phase	361	39	37	16	453	.1
Davidson loam eroded sloping and strongly sloping phases	76	202	4	1	283	.1
Davidson clay loam, severely eroded sloping phase	41	29	2	----------	72	(1)
Durham sandy loam:						
Gently sloping phase	337	90	27	10	464	.1
Sloping phase	92	27	18	15	152	(1)
Gullied land	783	15,208	1,651	704	18,346	4.8
Helena sandy loam, eroded sloping phase	54	96	14	28	192	.1
Hiwassee fine sandy loam:						
Eroded sloping phase	71	72	24	13	180	(1)
Eroded strongly sloping phase	64	113	45	35	257	.1
Iredell soils, eroded sloping phases	102	126	70	72	370	.1
Lloyd sandy loam:						
Eroded gently sloping phase	1,169	107	208	106	1,590	.4
Eroded sloping phase	146	106	17	9	278	.1
Lloyd gravelly sandy loam:						
Eroded gently sloping phase	2,337	299	353	181	3,170	.8
Sloping phase	11	1,406	5	4	1,426	.4
Eroded sloping phase	1,553	2,069	487	226	4,335	1.1
Strongly sloping phase	2	1,605	----------	----------	1,607	.4
Eroded strongly sloping phase	59	2,433	50	33	2,575	.7
Moderately steep phase	----------	894	3	----------	897	.2
Lloyd gravelly clay loam:						
Severely eroded gently sloping phase	2,433	913	864	590	4,800	1.3
Severely eroded sloping phase	11,390	17,879	6,328	3,996	39,593	10.3
Very severely eroded sloping phase	203	903	400	138	1,644	.4
Severely eroded strongly sloping phase	1,745	20,250	1,568	1,286	24,849	6.5
Very severely eroded strongly sloping phase	185	1,244	299	200	1,928	.5
Severely eroded moderately steep phase	47	715	71	40	873	.2
Lloyd clay loam:						
Severely eroded gently sloping phase	1,361	267	469	413	2,510	.7
Severely eroded sloping phase	1,739	2,097	838	658	5,332	1.4
Lloyd stony sandy loam:						
Strongly sloping phase	18	3,918	42	54	4,032	1.1
Moderately steep phase	6	3,781	2	27	3,816	1.0

Footnote at end of table.

TABLE 19.—*Acreage by land use, total acreage, and proportionate extent of the soils mapped.*—Continued

Soil	Cultivated	Woodland	Idle	Permanent pasture	Total area	Proportionate extent
	Acres	*Acres*	*Acres*	*Acres*	*Acres*	*Percent*
Lloyd stony clay loam:						
Severely eroded sloping phase	152	527	252	192	1,123	.3
Severely eroded strongly sloping phase	266	2,625	437	225	3,553	.9
Lloyd gravelly clay loam:						
Severely eroded sloping shallow phase	474	506	361	106	1,447	.4
Severely eroded strongly sloping shallow phase	464	2,319	628	191	3,602	.9
Louisa gravelly sandy loam, moderately steep and steep phases	2	1,123	15	13	1,153	.3
Louisa stony sandy loam, steep phase	51	1,799	38	30	1,918	.5
Louisburg stony sandy loam:						
Sloping phase	34	79	18	18	149	(1)
Moderately steep and steep phases	492	2,813	302	112	3,719	1.0
Madison gravelly fine sandy loam:						
Eroded gently sloping phase	208	81	39	36	364	.1
Eroded sloping phase	347	481	118	49	995	.3
Eroded strongly sloping phase	42	1,295	22	6	1,365	.4
Moderately steep phase		751	1	9	761	.2
Madison gravelly clay loam:						
Severely eroded sloping phase	2,877	4,438	1,421	705	9,441	2.5
Very severely eroded sloping phase	62	188	65	24	339	.1
Severely eroded strongly sloping phase	470	6,231	589	266	7,556	2.0
Very severely eroded strongly sloping phase	70	733	115	22	940	.2
Severely eroded moderately steep phase	46	677	34	14	771	.2
Madison clay loam, severely eroded gently sloping phase	687	219	116	184	1,206	.3
Madison soils:						
Sloping graphitic phases	53	126	13	26	218	.1
Eroded strongly sloping graphitic phases	27	598	26	4	655	.2
Mecklenburg clay loam, severely eroded sloping phase	243	335	139	69	786	.2
Rock land		60	3		63	(1)
Rough broken land		1,131			1,131	.3
Sandy alluvial land, poorly to somewhat poorly drained	1,787	38,993	1,433	1,970	44,183	11.5
Seneca sandy loam	1,362	432	386	305	2,485	.6
Shallow land:						
Sloping	44	212	106	76	438	.1
Strongly sloping	238	1,020	122	69	1,449	.4
Starr soils	1,498	862	700	522	3,582	.9
Stony land		1,575	11	12	1,598	.4
Talladega gravelly loam, moderately steep phase	1	313			314	.1
Wickham fine sandy loam:						
Eroded sloping phase	182	114	103	105	504	.1
Eroded strongly sloping phase	20	104	12	21	157	(1)
Worsham sandy loam	120	357	78	149	704	.2
Subtotal	99,536	211,891	40,681	24,589	376,697	98.4
Urban, water, mines, and pits					6,023	1.6
Total					382,720	100.0

[1] Less than 0.1 percent of the total area.

served. The soil is low in organic matter and moderate to low in fertility, but it readily responds to fertilizer.

Use and management.—The hazard of erosion is slight to moderate. This soil, therefore, needs a complete water disposal system, contour cultivation, and rotations that include thick-growing crops at least half the time. The soil is suited to many kinds of crops. Medium to high yields can be expected under good management. Capability unit IIe–2.

Appling sandy loam, sloping phase (6 to 10 percent slopes) (AdC).—This soil is similar to Appling sandy loam, gently sloping phase. It differs largely in that it has stronger slopes, more rapid surface runoff, less infiltration of water, and greater erosion hazard. Included is a small acreage that has a tough, heavy, yellowish-brown clay subsoil with red mottles.

Use and management.—Tilth and good yields can be maintained only by careful management. Conservation practices suggested for cultivated crops are water disposal and crop rotation. The rotation should include a close-growing crop 2 out of every 3 years. Capability unit IIIe–2.

Appling gravelly sandy loam, gently sloping phase (2 to 6 percent slopes) (AcB).—In color, texture, and consistence this soil is similar to Appling sandy loam, gently sloping phase. The main difference is content

of gravel. The following describes a profile of this soil in a cultivated area:

0 to 6 inches, light brownish-gray very friable gravelly sandy loam.
6 to 10 inches, light yellowish-brown very friable gravelly sandy loam.
10 to 29 inches, yellowish-red friable gravelly sandy clay; breaks easily to subangular blocky pieces.
29 to 45 inches, yellowish-red friable gravelly sandy clay that is highly mottled with red and yellowish brown; breaks easily to subangular blocky pieces.
45 to 50 inches +, yellowish-red to red, firm, massive sandy clay highly mottled with red, yellow, and yellowish brown; gradual transition to partially weathered granite and gneiss.

The profile is 17 to 56 inches deep to the massive clay. Included is a small acreage that has a yellowish-brown gravelly sandy loam surface soil and a tough, heavy, yellowish-brown gravelly clay subsoil with many red mottles. Angular pieces of quartz gravel, 3 inches or less in diameter, are scattered over the surface and imbedded in the profile. Included is a small acreage that has slopes of less than 2 percent.

Although moderate to low in fertility and low in organic matter, this soil responds well to fertilization. It is permeable to roots and moisture and has good tilth and moderate available moisture-holding capacity. Except where much gravel is on the surface, the soil is easily worked. The erosion hazard is slight to moderate.

Use and management.—The soil needs the protection of terraces, contour cultivation, and a complete water-disposal system that includes vegetated waterways. Close-growing crops ought to be kept on the soil half the time. With good management, medium to high yields can be expected from many crops. Machinery may be damaged by gravel. Capability unit IIe–2.

Appling gravelly sandy loam, sloping phase (6 to 10 percent slopes) (AcC).—This soil occurs on stronger slopes than Appling gravelly sandy loam, gently sloping phase. Because of the more rapid surface runoff, less water infiltrates. The erosion hazard is greater, and erosion is more difficult to control.

Included is a small acreage in which the surface soil is similar to that of the gently sloping phase and the subsoil is a heavy, tough clay mottled with red. Another small, shallow acreage is 12 to 17 inches deep to bedrock. These included areas are more suited to sod crops, which can be used for pasture or hay.

Use and management.—Only intensive management will maintain tilth and yields. Conservation practices should include use of a complete water-disposal system with vegetated waterways, contour cultivation, and crop rotations that keep close-growing sod crops on the soil 2 out of every 3 years. Machinery must be handled carefully to prevent its being damaged by gravel. Capability unit IIIe–2.

Appling gravelly sandy loam, strongly sloping phase (10 to 15 percent slopes) (AcD).—This soil is on stronger slopes than Appling gravelly sandy loam, gently sloping phase, and has a slightly thinner profile. The depth to bedrock is 15 to 40 inches. Runoff is moderately rapid. On areas without plant cover, sheet and gully erosion are active and difficult to control. The soil is permeable and has good tilth and productivity.

Use and management.—The strong slopes and moderate to severe hazard of erosion make this soil better for close-growing, deep-rooted perennial sod crops than for cultivated crops. Intensive management and erosion control are needed to conserve the cultivated soil. The gravel may damage farm machinery. Capability unit IVe–1.

Appling gravelly sandy loam, moderately steep phase (15 to 25 percent slopes) (AcE).—This soil is similar to Appling gravelly sandy loam, gently sloping phase, but it is not so deep to massive clay or bedrock. The surface soil, 5 to 7 inches thick, is fairly high in organic matter. The depth of the profile to bedrock is 15 to 36 inches.

Runoff is rapid to very rapid, and infiltration of water is, therefore, less than on the gently sloping phase of Appling gravelly sandy loam. The soil has good tilth and is productive. Sheet and gully erosion, however, are very active and extremely difficult to control in areas without a good plant cover.

Use and management.—Most of this soil is in mixed hardwood and pine forest. If it is cleared, close-growing pasture and hay crops, preferably deep-rooted perennials, can be grown under good management. The moderately steep slopes and rapid surface runoff make this a better soil for hay and pasture or for trees than for cultivated crops. Mowers and similar machinery may be damaged by gravel. Capability unit VIe–2.

Appling gravelly sandy clay loam, severely eroded gently sloping phase (2 to 6 percent slopes) (AbB3).—The following describes a profile of this soil in a cultivated area:

0 to 6 inches, variegated pattern made up of small areas of light-brownish gray very friable gravelly sandy loam and yellowish-brown friable gravelly sandy clay loam.
6 to 18 inches, yellowish-red friable gravelly sandy clay; breaks easily to subangular blocky pieces.
18 to 33 inches, yellowish-red friable gravelly sandy clay highly mottled with red and yellowish brown; breaks easily to subangular blocky pieces.
33 to 37 inches +, yellowish-red, firm, massive clay highly mottled with red, yellow, and yellowish brown.

The profile is 15 to 38 inches deep to massive clay. In a small area the texture of the surface layer may be sandy loam, sandy clay loam, and mixtures of these. Accelerated erosion has removed much of the original surface soil in an uneven pattern. Cultivation has mixed the remainder of the original surface soil with the upper part of the subsoil.

Surface runoff is medium to rapid, and permeability is moderate to slow. The soil has moderate available moisture-holding capacity. Tilth is not so good as in the gently sloping phases of Appling sandy loam and Appling gravelly sandy loam. The hazard of erosion is severe, and erosion is difficult to control.

Use and management.—Good management is required to produce high yields on this soil and to prevent further erosion. Row crops can be grown, but the soil is better suited to grasses and legumes grown for pasture and hay. Capability unit IIIe–2.

Appling gravelly sandy clay loam, severely eroded sloping phase (6 to 10 percent slopes) (AbC3).—This soil is permeable to roots and moisture down to the massive clay layer. Runoff is rapid. Tilth is moderately good. Sheet erosion and gully erosion are active and difficult to control. Included with this soil are small acreages that have a heavy, tough, yellowish-brown clay subsoil that is mottled with red.

Use and management.—Intensive management is needed if this soil is cultivated. The impaired tilth and severe erosion hazard make this soil better for pasture and hay crops than for cultivated crops. If cultivated, the soil ought to be kept in close-growing crops, preferably deep-rooted perennials, three-fourths of the time. The gravel is a hazard to the use of mowers and other farm machinery. Capability unit IVe–10.

Appling gravelly sandy clay loam, severely eroded strongly sloping phase (10 to 15 percent slopes) (AbD3).—The soil is slowly to moderately permeable. Surface runoff is rapid to very rapid. Productivity is good, but tilth is moderately poor. Sheet and gully erosion are very active and difficult to control.

Use and management.—Strong slope and relatively poor tilth make this soil unsuitable for row crops. It is better suited to pasture and hay, but good grassland management is needed to establish and maintain a thick plant cover. Probably the best use is for woodland, especially suitable species of pine. Mowers and other machinery must be used carefully to prevent damage from gravel. Capability unit VIe–2.

Appling stony sandy loam, sloping phase (6 to 10 percent slopes) (AeC).—The following describes a profile of this soil in a cultivated area:

0 to 5 inches, light brownish-gray very friable stony sandy loam.
5 to 17 inches, yellowish-red friable stony sandy clay; breaks easily to subangular blocky pieces.
17 inches +, partially weathered granite and gneiss bedrock and boulders.

This soil is 12 to 20 inches deep to bedrock. Stones more than 10 inches in diameter are scattered over the surface and imbedded in the profile. Dikes of granite and gneiss extend to and above the surface layer. Permeability to plant roots and moisture is moderate. Because of the low available moisture-holding capacity, this soil is droughty. It is low in fertility and responds slowly to fertilization. Included with this soil are small areas that are gently sloping.

Use and management.—Stones, shallow depth, and poor tilth limit use of this soil. The less stony areas are suited to pasture, but the soil is best used as woodland. Little use can be made of farm machinery, and the risk of damaging it is moderate to high. Capability unit IVe–5.

Buncombe series

The Buncombe series consists of deep, well drained to excessively drained soils on nearly level flood plains along the larger streams. Their parent material washed from soils derived from granite and gneiss. These light-textured soils are associated with soils of heavier texture, the well drained Congaree soils, and the moderately well drained Chewacla soils. The Buncombe soils belong to the Alluvial great soil group. Only one soil of the series is mapped in this county.

Buncombe loamy sand (0 to 6 percent slopes) (Bc).—This soil occurs mainly along the Tallapoosa and Chattahoochee Rivers. The following describes a profile in a pasture:

0 to 10 inches, brown very friable loamy sand.
10 to 46 inches, strong-brown very friable loamy sand; breaks easily to a fine crumbly mass or to individual grains of sand.
46 to 50 inches +, unconsolidated or weakly cemented beds of gravel or sand.

Mica flakes are present throughout the profile in many places. The depth of this soil to underlying beds of gravel or unconsolidated sand ranges from 36 to 84 inches. The color of the 0- to 10-inch layer ranges from grayish brown to dark brown. The 10- to 46-inch layer ranges from strong brown to reddish yellow in color and from loamy fine sand to fine sandy loam in texture.

This soil has rapid permeability to a considerable depth. The available moisture-holding capacity is low, and the soil is droughty. Surface runoff is slow, and internal drainage is rapid to very rapid. The soil is subject to a few river overflows lasting a relatively short time. Accumulations of sandy soil material are left after overflows, and some detrimental deposits of sand may occur.

Fertility and organic matter are low, and the soil is strongly acid.

Use and management.—The soil has good tilth and is easily worked and conserved. The hazard of overflow and the droughty nature of the soil limit suitability for crops. Medium to high yields of crops can be expected under good management, especially fertilization. Capability unit IIe–2.

Cecil series

The Cecil series consists of shallow to deep, well-drained soils developed on the Piedmont upland from granite and gneiss. Cecil soils occur over most of the county; they are gently sloping to moderately steep. They are associated with the shallow Louisburg and the yellowish-red Appling and the darker red Lloyd soils.

Cecil soils have a dark-brown to red surface soil varying from sandy loam to clay loam. The strongly acid subsoil is dark-red friable to firm sandy clay. The series is in the Red-Yellow Podzolic great soil group.

The native vegetation was mixed hardwoods and pines. Most of the acreage has been cleared for pasture and crops. Loblolly, shortleaf, and longleaf pines grow on land that has been withdrawn from production of crops and pasture.

Cecil sandy loam, eroded gently sloping phase (2 to 6 percent slopes) (CcB2).—The following describes a profile of this soil in a cultivated area:

0 to 6 inches, brown to dark-brown very friable sandy loam.
6 to 10 inches, red friable sandy clay loam; breaks easily to subangular blocky pieces.
10 to 25 inches, dark-red friable to firm sandy clay; breaks to subangular blocky pieces less easily than the above layer.
25 to 31 inches, red friable fine sandy clay; breaks easily to subangular blocky pieces.
31 to 50 inches +, red friable sandy clay mottled with yellow, reddish yellow, and yellowish brown; massive (structureless); gradual transition to partially weathered granite and gneiss.

The profile is 17 to 39 inches deep to the massive sandy clay. Included is a small acreage that is nearly level, and a small acreage that is 12 to 17 inches deep to bedrock.

The soil is moderately permeable to roots and moisture and has a moderate moisture-supplying capacity. Runoff is medium. Although low in organic matter, this soil has good tilth and high fertility when compared to other local soils.

Use and management.—The hazard of erosion is slight to moderate. Therefore, cultivated areas need a complete water-disposal system, contour cultivation, and rotations that include thick-growing crops half of the time. With good management, high yields can be produced from the wide variety of crops suited to this soil. Capability unit IIe–1.

Cecil sandy loam, eroded sloping phase (6 to 10 percent slopes) (CcC2).—This soil is similar to Cecil sandy loam, eroded gently sloping phase, but it has slightly stronger slopes. Because of the more rapid surface runoff, less water infiltrates. Sheet and gully erosion are greater and more difficult to control.

About half of the acreage has slopes ranging from strongly sloping to moderately steep. A small shallow acreage is 12 to 17 inches deep to bedrock.

Use and management.—Intensive management must be used to control the erosion. Among conservation practices needed to maintain tilth and productivity are a complete water-disposal system and crop rotation. The strongly sloping and shallow areas are more suitable to pasture (fig. 6) and hay crops than to row crops, because of the rate of runoff. Capability unit IIIe–1.

Cecil gravelly sandy loam, eroded gently sloping phase (2 to 6 percent slopes) (CbB2).—The following describes a profile of this soil in a cultivated area:

0 to 6 inches, brown to dark-brown very friable sandy loam; pieces of angular quartz gravel up to 3 inches in diameter are scattered over the surface and imbedded in the profile.
6 to 10 inches, red friable gravelly sandy clay loam; breaks easily to subangular blocky pieces.
10 to 25 inches, red friable to firm gravelly sandy clay; breaks to subangular blocky pieces less easily than the layer above.
25 to 31 inches, red friable gravelly fine sandy clay; breaks easily to subangular blocky pieces.
31 to 35 inches +, red friable sandy clay mottled with yellow, reddish yellow, and yellowish brown; massive (structureless); gradual transition to partially weathered granite and gneiss.

The profile is 17 to 39 inches deep to the massive sandy clay. Included is a small acreage that is 12 to 17 inches deep to bedrock, and scattered over its surface are stones larger than 10 inches in diameter. This included area is shown on the soil map with stone symbols.

The soil has medium runoff and moderate to moderately rapid permeability. Although low in organic matter, it has good tilth and high fertility.

Use and management.—Measures to control erosion are needed because of the surface runoff. Conservation practices for cultivated crops should include a complete water-disposal system, contour cultivation, and a suitable rotation. The soil will grow a wide variety of crops, and good yields can be expected under careful management. Gravel and stones reduce workability in some places. The shallow stony areas are best suited to pasture or woods. Machinery should be used with caution where gravel or stones are present. Capability unit IIe–1.

Cecil gravelly sandy loam, eroded sloping phase (6 to 10 percent slopes) (CbC2).—This soil is similar to

Figure 6.—Alfalfa pasture on Cecil sandy loam, eroded sloping phase.

Cecil gravelly sandy loam, eroded gently sloping phase. Slopes, however, are slightly stronger, runoff is greater, infiltration is less, and erosion is more active. Included is a small acreage, 12 to 17 inches deep to bedrock, that has scattered stones larger than 10 inches in diameter. This included acreage is shown on the map by stone symbols.

Use and management.—Because of erosion, good management is needed to keep the soil in good tilth and productive. The cultivated soil needs the protection of water-disposal systems and crop rotations. The soil is best used for pasture or as woodland. Farm machinery must be used carefully where stones and gravel occur. Capability unit IIIe–1.

Cecil gravelly sandy loam, eroded strongly sloping phase (10 to 15 percent slopes) (CbD2).—This soil, more strongly sloping than the Cecil gravelly sandy loam, eroded gently sloping phase, has a slightly thinner surface soil and contains more gravel and stones. The profile is from 15 to 31 inches deep to the massive clay or bedrock.

Runoff is more rapid than on the eroded gently sloping phase, and though permeability is moderate, less water infiltrates into the soil. Sheet and gully erosion are active and hard to control.

Included with this soil is a small acreage, 12 to 15 inches deep to bedrock, on which stones more than 10 inches in diameter are scattered. These included areas are shown on the map by stone symbols.

Use and management.—This soil is suitable for pasture and hay. It can be used for cultivated crops, but only under intensive management. If the soil is cultivated, long-term rotations of close-growing plants are needed to protect and maintain it. Where machinery is used, care must be practiced to prevent damage by stones and gravel. Capability unit IVe–1.

Cecil gravelly sandy loam, eroded moderately steep phase (15 to 25 percent slopes) (CbE2).—The surface layer of this soil is thinner than that of Cecil gravelly sandy loam, eroded gently sloping phase, and contains more rock and gravel fragments. The profile is shallower, or 12 to 31 inches deep to the partly weathered massive soil material. Even though permeability is moderate, runoff is high and infiltration of moisture is low. Sheet and gully erosion are active unless the ground cover is good.

Included are small areas on slopes in excess of 25 percent and small acreages that have stones larger than 10 inches in diameter. The stony areas are shown on the map by stone symbols.

Use and management.—This soil is not suited to cultivated crops, for it is steep and erodible. It is better for pasture and other sod crops. Probably this soil is best used as woodland. Capability unit VIe–2.

Cecil gravelly clay loam, severely eroded gently sloping phase (2 to 6 percent slopes) (CaB3).—The following describes a profile from a cultivated area:

0 to 5 inches, red friable gravelly sandy clay loam; breaks easily to subangular blocky pieces.
5 to 20 inches, dark-red friable to firm gravelly sandy clay; slightly harder to break to subangular blocky pieces than layer above.
20 to 26 inches, red friable gravelly fine sandy clay; breaks easily to subangular blocky pieces.
26 to 30 inches +, friable sandy clay mottled with red; massive (structureless).

The profile ranges from 12 to 31 inches deep to the massive clay. In most of the acreage, angular fragments of quartz gravel are scattered over the surface and imbedded in the profile, but some areas are gravel free. A small acreage has stones on the surface and in the soil. These areas are designated on the map by stone symbols.

The surface layer of this soil is friable when moist, hard and crusted when dry, and sticky when wet. Permeability to roots and moisture is moderate. Runoff is rapid unless there is a good ground cover.

Use and management.—This soil is extremely difficult to work. Only at certain moisture levels can it be cultivated. When dry, it is hard; and when wet, it forms clods that are not easy to break.

Under good management this soil will give good yields of a wide variety of crops, for it has high fertility. It is also suited to pasture, hay, and trees.

The severe hazard of erosion and difficulty of working this soil limit its use for row crops. Organic matter is needed to help improve tilth. Crop rotations that keep thick-growing crops on the soil at least two-thirds of the time are suggested. A complete water-disposal system is needed that uses vegetated waterways, terraces, and contour cultivation. Machinery must be used with caution in stony or gravelly areas. Capability unit IIIe–12.

Cecil gravelly clay loam, severely eroded sloping phase (6 to 10 percent slopes) (CaC3).—This soil has more rapid surface runoff and greater hazard of erosion than the severely eroded gently sloping phase of Cecil gravelly clay loam.

Included are small areas that are free of gravel and small areas in which stones more than 10 inches in diameter are scattered over the surface. The stony inclusions are shown on the map by stone symbols.

Use and management.—A rotation is suggested that keeps the soil in close-growing sod crops 3 years out of 4. The management plan should also include a complete water-disposal system.

The poor tilth and clayey nature of the surface soil, along with the gravel and stones, make this soil more suitable for grasses and legumes than for tilled crops (fig. 7). Certain types of machinery must be used

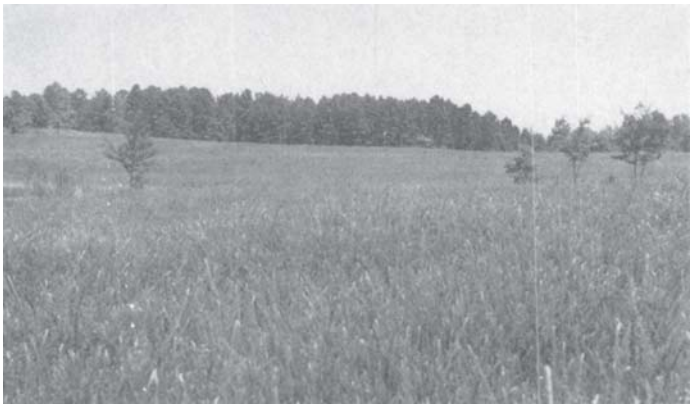

Figure 7.—**Erosion control on Cecil soils by sericea lespedeza and woodland.**

with care to prevent damage from gravel and stones. Pines, especially loblolly, grow well. Capability unit IVe–10.

Cecil gravelly clay loam, very severely eroded sloping phase (6 to 10 percent slopes) (CaC4).—Erosion has removed most of the surface layer from this soil. The surface layer remaining is a dark-red, friable to firm gravelly sandy clay some 10 to 15 inches thick. The depth to the massive clay layer ranges from 12 to 24 inches. Surface runoff is rapid to very rapid. Permeability is moderate in the surface soil and subsoil. The hazard of erosion is very severe, and gullies are common. This soil is strongly acid and almost totally lacking in organic matter. Tilth is very poor.

Included in this soil are small areas in which stones more than 10 inches in diameter are scattered over the surface. These areas are shown on the map by stone symbols.

Use and management.—The severe erosion and poor tilth of this soil make it unsuitable for cultivation. Under good management, including fertilization, it can produce fair to good stands of grasses and legumes suitable for pasture and hay. Machinery may be damaged by gravel. It is best to use this soil for pine woodland. Capability unit VIe–2.

Cecil gravelly clay loam, severely eroded strongly sloping phase (10 to 15 percent slopes) (CaD3).—This soil is 12 to 28 inches deep to the massive clay. Permeability is moderate, but surface runoff is rapid. Sheet and gully erosion are active, especially in areas where adequate cover is not maintained.

Included is a small acreage on slopes of 15 to 25 percent, and a small acreage in which stones more than 10 inches across are scattered over the surface. The stony areas are shown on the map by stone symbols.

Use and management.—This soil is not suited to cultivation; it has strong to steep slopes, a clayey surface soil, and poor tilth. It is moderate in fertility and, under good management, is suitable for pasture and hay crops. Because of stones and gravel, machinery must be used with caution. Probably it is better to grow pine trees on this soil than pasture or hay. Capability unit VIe–2.

Cecil gravelly clay loam, very severely eroded strongly sloping phase (10 to 15 percent slopes) (CaD4).—All or nearly all of the red friable clay loam surface layer has been lost through erosion. The present surface layer is 8 to 12 inches of dark-red firm sandy clay. The depth to the massive clay layer or underlying rock is 12 to 20 inches.

Surface runoff is rapid to very rapid, permeability is moderate, and the hazard of erosion is high. Numerous shallow gullies and a few deep gullies occur. The soil is strongly acid and contains little or no organic matter. Tilth is extremely poor.

Included with this soil is a small acreage on slopes ranging up to 25 percent, and also a small acreage in which stones are scattered over the surface.

Use and management.—Strong slopes, shallowness, the clayey surface soil, and poor tilth make this soil unsuitable for cultivation. With good management, including fertilization, some grasses and legumes can be grown for pasture. Nevertheless, it is difficult to establish and maintain a plant cover. The strong slopes and stony areas limit the use of machinery. Probably this soil is best used as woodland, which preferably should consist mainly of pine. Capability unit VIIe–1.

Chewacla series

In the Chewacla series are deep, nearly level, moderately well drained soils on first bottoms. They are forming in sediments washed from the Piedmont Plateau and deposited along streams.

The Chewacla soils are associated with the well drained Congaree, the well to excessively drained Buncombe, and the poorly to somewhat poorly drained Sandy alluvial land. The Chewacla soils belong to the Alluvial great soil group.

About half of the Chewacla acreage is cleared and in crops and pasture. The rest is in trees, mostly water-tolerant hardwoods.

Chewacla loam (0 to 2 percent slopes) (Cd).—The following describes a profile of this soil in a cultivated area:

0 to 7 inches, yellowish-red friable to very friable loam.
7 to 15 inches, yellowish-red very friable to friable loam to sandy loam; breaks easily to a crumbly mass.
15 to 26 inches, yellowish-red to reddish-brown friable loam to sandy loam mottled with gray and yellow; breaks easily to a crumbly mass.
26 to 30 inches +, yellowish-brown, dark reddish-brown, gray, and yellow loams, sandy loams, and sands; highly mottled; gradual transition to gray wet sands.

The depth to mottlings is 12 to 30 inches. Mica flakes occur throughout the profile in some areas. In places iron concretions occur at depths of 24 to 30 inches.

The soil is moderately permeable. Its available moisture-holding capacity is sufficient for all commonly grown plants, and runoff is slow. Overflows occur rather frequently, mainly during winter but occasionally during the growing season. These overflows often leave detrimental deposits of infertile soil material. Some scouring occurs during overflows. Although low in organic matter and strongly acid, the soil has good tilth and is easy to work.

Use and management.—Impaired drainage limits the use of this soil for cultivated crops. It is well suited to grasses and legumes grown for pasture or hay. High yields can be expected from these crops under good management. Ditches or other means of drainage are needed on much of the soil. Corn produces good yields when not damaged by overflow. Capability unit IIw–2.

Chewacla sandy loam (0 to 2 percent slopes) (Ce).—This soil is sandier through the profile than Chewacla loam. The surface soil ranges from sandy loam to fine sandy loam in texture and from brown to light yellowish brown in color. It is lighter colored than the surface soil of Chewacla loam. Internal drainage is probably more rapid than in Chewacla loam.

Use and management.—This soil is highly fertile. It is well suited to grasses and legumes grown for pasture and hay. This soil, like Chewacla loam, is good for corn production. Occasional overflows may damage young stands, however, and yields will be reduced if the growing season is excessively wet. This

soil needs the same type of drainage as Chewacla loam. Capability unit IIw–2.

Colfax series

The Colfax series consists of moderately deep to deep, imperfectly drained soils. They occur only in areas underlain by granite and gneiss. They are on nearly level to sloping terrain around the heads of minor streams and on divides between draws. They also occur at the bases of sloping to strongly sloping areas. These soils are associated with the well drained Appling and the well drained to moderately well drained Durham soils.

Colfax soils have a coarse sandy loam surface soil and a pale-yellow subsoil of mottled, coarse sandy clay loam. They are in the Red-Yellow Podzolic great soil group.

Most of the Colfax acreage has been cleared and is used for crops and pasture.

Colfax sandy loam, gently sloping phase (2 to 6 percent slopes) (CfB).—The following describes a profile of this soil in a cultivated area:

0 to 13 inches, pale-olive very friable coarse sandy loam.
13 to 29 inches, pale-yellow coarse sandy clay loam mottled with red, yellow, and brown; slightly sticky when wet, friable when moist; breaks easily to subangular blocky pieces.
29 to 50 inches +, coarse sandy clay strongly mottled with light gray, yellow, and brown; sticky when wet, friable when moist; massive (structureless); gradual transition to partly weathered rock at depths of 50 to 70 inches.

The permeability of this soil is moderate to moderately slow. It has moderate capacity to hold moisture for plant use. The soil is low in organic matter and in fertility. It is strongly acid. It has good tilth, however, and is easily worked when not too wet.

Included with this soil are small acreages on slopes of less than 2 percent, as well as some areas on slopes of 6 to 10 percent.

Use and management.—Imperfect drainage and low fertility limit the use of this soil. With careful management, it may produce fair yields, especially of pasture and hay. Much of the acreage formerly cleared now supports a mixed cover of pines and hardwoods. Capability unit IIIe–3.

Colfax sandy loam, gently sloping thick surface phase (2 to 6 percent slopes) (CgB).—The following describes a profile of this soil in a pasture:

0 to 6 inches, dark grayish-brown very friable sandy loam.
6 to 14 inches, olive very friable sandy loam.
14 to 21 inches, olive-yellow very friable sandy loam; wet and waterlogged during rainy seasons.
21 to 23 inches, yellow to yellowish-brown compact sandy clay faintly mottled with brown; contains small iron concretions.
23 to 40 inches, yellowish-brown friable sandy clay that is faintly mottled in the lower part; breaks easily to subangular blocky pieces.
40 to 69 inches, heavy clay strongly mottled with gray, yellow, and brown; massive (structureless); gradual transition to partly weathered granite at a depth of about 60 inches.

In the upper layers, the permeability is moderately rapid. The 21- to 23-inch layer, however, is compact, moderately slow in permeability, and resistant to root penetration. The capacity to hold water available to plants is moderate. The soil is strongly acid and low in organic matter and fertility; it does not respond readily to fertilizer. It has good tilth and is easily worked.

Use and management.—Impaired drainage and low fertility limit the suitability of this soil. It is probably better suited to legumes and grasses grown for pasture and hay than it is to cotton, corn, or similar row crops. Good yields require careful management, including fertilization and disposal of water. Capability unit IIIe–3.

Colfax sandy loam, sloping thick surface phase (6 to 10 percent slopes) (CgC).—Surface runoff and lateral movement of water are a little more rapid on this soil than on Colfax sandy loam, gently sloping thick surface phase. Internal drainage is imperfect to slow. On the whole, this soil is slightly better drained than the gently sloping thick surface phase. It is easily worked but low in fertility. Response to fertilizer is limited.

Use and management.—Impaired drainage and low fertility seriously limit the use of this soil for crops. It can be used for row crops but is probably better suited to grasses and legumes that will provide hay and pasture. Suitable crop rotations and a complete system for water disposal are needed if the soil is cultivated. Capability unit IIIe–3.

Congaree series

The soils of the Congaree series are deep, friable, and well drained. They are on first bottoms along streams. The parent material has been washed from soils of the Piedmont Plateau. The Congaree soils belong to the Alluvial soil group, as do the Buncombe and Chewacla, with which they are associated. In this county one soil of the Congaree series is mapped. Most of it is cleared, and the major part of the cleared acreage is cultivated or in pasture.

Congaree loam (0 to 2 percent slopes) (Ch).—The following describes a profile of this soil in a pasture:

0 to 8 inches, brown friable loam.
8 to 16 inches, yellowish-brown friable loam.
16 to 48 inches, strong-brown to yellowish-brown very friable fine sandy clay loam; breaks easily to subangular blocky pieces.
48 inches +, unconsolidated or weakly cemented beds of gravel or beds of sand and loamy sand.

In most places mica flakes occur throughout the profile. The soil ranges from 36 to 60 inches deep to the beds of gravel or sand. The texture of the surface layer varies; it is a loam, silt loam, very fine sandy loam, or sandy loam. The color of the surface layer ranges from reddish brown to grayish brown.

This soil has rapid permeability to a depth of several feet. Its capacity to hold water available to plants is moderate. Runoff is slow, and internal drainage is medium to rapid. The soil is occasionally reached by overflows from streams. These normally occur in winter. The flooding lasts only a few days and has little effect on the kinds of crops planted. It often leaves soil material, in some places detrimental deposits of infertile sand. The soil is moderately fertile and highly productive. The supply of organic matter is low, and the soil is strongly acid. It has good tilth and is easy to work. Capability unit IIw–2.

Davidson series

The Davidson series consists of moderately deep to deep, well-drained soils on the uplands. They have a dark-red loam or clay loam surface soil and a dark-red friable to firm clay subsoil. They occur on gently sloping to strongly sloping relief. The Davidson soils are of limited acreage and occur in small patches in the eastern and southwestern parts of the county. Geographically, they are associated with the Lloyd soils. They were derived from basic rock, such as hornblende and diorite, whereas the Lloyd soils were derived from mixed basic and acidic rock. The Davidson soils have a finer texture and a darker brown surface soil than the Lloyd.

The Davidson soils are highly fertile, medium acid, and moderate in their available moisture-holding capacity. They have a wide range of use suitability. Although limited in acreage, they are probably the most productive soils in the county. The series is in the Reddish-Brown Lateritic great soil group.

The native vegetation was mixed hardwoods and pines. Nearly all of the acreage has been cleared, except for small patches around homesites. This cleared acreage is in cultivation or in pasture.

Davidson loam and clay loam, eroded gently sloping phase (2 to 6 percent slopes) (DcB2).—The following describes a profile of one of these soils in a cultivated area:

0 to 6 inches, dark-red friable loam.
6 to 39 inches, dark-red friable to firm clay; breaks easily to subangular blocky pieces.
39 inches +, basic rocks; dark-red friable to firm clay material in spaces and crevices between the rocks.
The profile is 30 to 52 inches deep to the basic rocks.

The soils are permeable to water and plant roots, and the available moisture-holding capacity is moderate. Surface runoff is slow to medium. The soils are highly fertile but are generally low in organic matter. Although they are sticky when wet, especially in the parts that are clay loam, they have good tilth and are easily worked and conserved under good management.

Use and management.—The hazard of erosion is moderate. Conservation practices suggested are rotation of crops, installing complete water-disposal systems, and contour cultivation. The soils are suited to many kinds of crops and produce high yields if fertilized. Capability unit IIe–1.

Davidson loam, eroded sloping and strongly sloping phases (6 to 15 percent slopes) (DbD2).—These soils are similar to Davidson loam and clay loam, eroded gently sloping phase. Surface runoff is more rapid, especially when cultivated, and the hazard of erosion is moderate to severe. The profile is slightly shallower, and the available moisture content is generally less favorable.

Use and management.—Stronger slopes, greater surface runoff, and increased hazard of erosion make this soil less suitable for intensive cultivation than Davidson loam and clay loam, eroded gently sloping phase. Intensive management, which includes use of crop rotations and a complete water-disposal system, are needed to conserve and maintain the cultivated soil. This soil is suited to nearly all of the grasses and legumes grown for pasture and hay. Capability unit IIIe–1.

Davidson clay loam, severely eroded sloping phase (6 to 10 percent slopes) (DaC3).—This heavy-textured clayey soil is difficult to work. The surface soil is sticky and cloddy, and good tilth is difficult to maintain. The soil has moderate permeability and available moisture-holding capacity. Surface runoff is more rapid than on the Davidson loam and clay loam, eroded gently sloping phase. As a result, the hazard of erosion is increased. Although low in organic matter, the soil is fertile, and more than half of its 72 acres is cultivated.

Use and management.—This soil is suited to many kinds of crops and produces high yields if fertilized. Organic matter can be added by turning under green-manure crops and crop residues. Rotations that cover the ground two-thirds of the time are suggested. Terraces, sodded waterways, and contour tillage are needed also. This soil is probably more suitable for pasture and hay crops than for row or intertilled crops. Capability unit IIIe–12.

Durham series

The Durham series consists of deep to moderately deep, well drained to moderately well drained soils of the Piedmont upland that developed from granite and gneiss. They have a friable sandy loam surface soil and a yellowish-brown sandy clay subsoil. These strongly acid soils occur on gently sloping ridgetops and areas sloping toward minor streams. They occur in the vicinity of Five Points, in the southwestern and west-central parts of the county, and they extend west and southwest to the county line. They are associated with the yellowish-red Appling, red Cecil, and the lighter colored, more poorly drained Colfax soils. The native vegetation was mixed hardwoods and pines. Almost all of the acreage has been cleared and is now in cultivated crops or pasture. The soils are in the Red-Yellow Podzolic great soil group.

Durham sandy loam, gently sloping phase (2 to 6 percent slopes) (DdB).—The following describes a profile of this soil in a cultivated area:

0 to 6 inches, dark grayish-brown very friable sandy loam.
6 to 16 inches, olive friable sandy loam.
16 to 32 inches, yellowish-brown friable sandy clay; breaks easily to subangular pieces.
32 to 40 inches, yellowish-brown friable sandy clay to sandy clay loam, mottled with brown; breaks easily to subangular pieces.
40 inches +, yellow, light-gray, and light-red granite and gneiss; friable, disintegrated, and partly weathered.

This soil is 30 to 50 inches deep to the partly weathered rock. The 32- to 40-inch layer has a weak fragipan that slightly impairs drainage and has moderate permeability to roots and water. During wet seasons, excessive water above this layer may be detrimental to plant growth. Internal drainage is medium to slow, and the available moisture-holding capacity is moderate. This soil is moderately fertile. It has good tilth and is easy to work and to conserve.

Use and management.—This soil is suitable for most crops grown in the county. Good yields can be produced if the soil is fertilized. Conservation practices should include use of adequate crop rotations, a com-

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plete water-disposal system, and cultivation on the contour. Capability unit IIe–2.

Durham sandy loam, sloping phase (6 to 10 percent slopes) (DdC).—This soil is similar to Durham sandy loam, gently sloping phase. It has slightly better internal movement of water, but surface runoff is a little higher. Permeability to roots and water is moderate down to the fragipan layer. The capacity for holding water that plants can use is moderate, tilth and workability are good, and fertility and productivity are moderate.

Use and management.—This soil has a wider range of crop suitability than on Durham sandy loam, gently sloping phase. Sheet erosion is a greater hazard, however, because surface runoff is higher. More intensive control of erosion is needed. Capability unit IIIe–2.

Gullied land

Gullied land (6 to 25 percent slopes) (Gd) consists of sloping to moderately steep, rough, gullied areas. Before the profiles were destroyed by erosion, the small areas of this land were Cecil, Appling, Durham, Lloyd, Madison, Louisa, Louisburg, Talladega, Iredell, Mecklenburg, or Helena soils. The parent material developed from acidic and basic rocks of both the igneous and metamorphic kinds.

The land has a network of gullies that generally cut deep into the parent material (fig. 8). The gullies

Figure 8.—**Deep caving-type gully on Gullied land (Cecil soil material).**

cannot be crossed by machinery. The profiles have been destroyed, except in small areas between gullies. Where the profiles remain, they are similar to those of the soils adjoining. In a few places the surface soil corresponds to that of the eroded or severely eroded phases of the soils that occur nearby. In some areas of this land, the islands of uneroded or partly eroded soil do not occur and the parent material may be exposed in tracts covering several acres. In other places the gullies have cut into very friable material, have undercut the banks, and have widened as the undercut banks fell down. Stone and gravel occur on some of this land.

Internal drainage is generally good, but little water enters the soil because runoff is rapid to excessive.

Use and management.—Most of this land type was once productive, but gullying now prohibits cultivation. Some of it is in poor pasture, and some is idle. Most of it has been abandoned and now supports a mixed cover of pines and other trees. It is not practical to reclaim this land, because nearly all of the desirable soil material is gone. The areas that could be reclaimed by smoothing would contain rock fragments and unweathered soil material. The best use is for woodland, probably loblolly pine. The less severely eroded areas can be pastured. Under good management, kudzu will provide supplementary grazing and help prevent further soil loss. Capability unit VIIe–1.

Helena series

In the Helena series are moderately deep, moderately well drained soils of the Piedmont upland. They have developed from a mixture of acidic and basic rock, mainly granite, granite gneiss, and quartz diorite. The limited acreage of these soils occurs in association with the more extensive Appling soils.

Helena soils have a very friable sandy loam surface soil and a heavy, strongly mottled subsoil.

The native vegetation was mixed hardwoods and shortleaf pine. Helena soils belong to the Red-Yellow Podzolic great soil group. Only one soil of the Helena series was mapped in this county.

Helena sandy loam, eroded sloping phase (6 to 10 percent slopes) (HaC2).—Small areas of this soil are scattered throughout the county. Most of the areas cover less than 10 acres. The following describes a profile in a cultivated area:

0 to 6 inches, light-gray very friable sandy loam.
6 to 11 inches, strong-brown friable sandy clay; breaks easily to subangular blocky pieces.
11 to 22 inches, yellowish-brown firm sandy clay mottled with yellow and red; slightly harder to break to subangular blocky pieces than layer above.
22 to 27 inches, yellowish-brown friable sandy clay with strong mottles of yellow and yellowish-red; breaks easily to subangular blocky pieces.
27 to 35 inches +, yellowish-brown firm sandy clay strongly mottled with yellowish red; massive (structureless).

The depth to the massive layer of sandy clay is 22 to 35 inches. Included with this soil is a small acreage on slopes of 2 to 6 percent, as well as small, severely eroded areas on slopes of 2 to 10 percent. These included areas have a strong-brown or yellowish-brown sandy clay surface layer.

The soil is slowly permeable and has medium surface runoff and low available moisture-holding capacity. Fertility and organic-matter content are low, and the soil is strongly acid. It has fairly good tilth and is moderately easy to work and conserve under good management. The severely eroded parts have poorer tilth and more rapid surface runoff than the areas not eroded.

Use and management.—Low fertility and the low capacity to hold moisture for plants limit the use of this soil for cultivated crops. Fair yields of some crops can be obtained if a rotation that keeps close-

growing crops on the soil most of the time is used and other good management is practiced. The soil is highly erodible and needs contour cultivation and a complete water-disposal system, including terraces and vegetated outlets. Capability unit IIIe–3.

Hiwassee series

The Hiwassee series consists of moderately deep to deep, well drained soils of the high terraces. The parent material was old alluvium washed from the upland Piedmont Plateau. The soils have a dark-brown fine sandy loam surface soil and dark-red clay subsoil. They are strongly acid and occur on gently sloping to strongly sloping land along the Tallapoosa and Chattahoochee Rivers. The limited acreage occurs with areas of the lighter colored Wickham soils, which are on low stream terraces or benches in most places. The Hiwassee soils are in the Reddish-Brown Lateritic great soil group.

All of the acreage has been cleared, and most of it is cultivated or in pasture. A small acreage that was once cultivated now supports a good cover of loblolly and shortleaf pines. The native vegetation was mixed hardwoods and pines.

Hiwassee fine sandy loam, eroded sloping phase (6 to 10 percent slopes) (HbC2).—The following describes a profile of this soil in a pasture:

0 to 6 inches, dark-brown very friable fine sandy loam.
6 to 12 inches, red friable sandy clay loam; breaks easily to subangular blocky pieces.
12 to 30 inches, dark-red friable to firm clay; breaks less easily to subangular blocky pieces than layer above.
30 inches +, unconsolidated or weakly cemented gravel beds.

The texture of the surface soil may be loam, fine sandy loam, or gravelly fine sandy loam. The profile is 24 to about 60 inches deep to the gravel beds or old residual material. The subsoil contains mica flakes in places. In some areas the gravel layer is absent and the soil has developed over old residuum. Included is a small acreage on gently sloping terrain and another small severely eroded acreage with slopes of 2 to 10 percent. These included areas have a 6- to 10-inch surface soil of red friable sandy clay loam.

This soil is well drained and permeable to a considerable depth. Its capacity to hold water available to plants is moderate. The soil is highly fertile and responds readily to fertilizer. Although low in organic matter, it has good tilth and is easily worked and conserved under good management. The severely eroded inclusions have more surface runoff, poorer tilth and workability, and are less suitable for cultivation. The hazard of erosion is moderate to severe.

Use and management.—This soil is suited to many kinds of crops and produces high yields under good management. Because of the hazard of erosion, careful management is needed to protect the cultivated soil. Conservation practices should include a complete water-control system, contour cultivation, and rotation of crops. Capability unit IIIe–1.

Hiwassee fine sandy loam, eroded strongly sloping phase (10 to 15 percent slopes) (HbD2).—This soil occurs on slightly stronger slopes than Hiwassee fine sandy loam, eroded sloping phase. Because of the more rapid runoff, the hazard of erosion is greater and erosion is more difficult to control. There are some small severely eroded areas. These have a red friable sandy clay loam surface soil that is 6 to 8 inches deep.

Use and management.—If this soil is cultivated, a rotation is suggested that keeps the soil under a good close-growing cover, preferably deep-rooted perennials, for 3 years out of 4. The soil is better for clover-grass pasture or hay than for cultivated crops. It is also well suited to trees. Capability unit IVe–1.

Iredell series

The Iredell series consists of shallow to moderately deep, imperfectly drained, heavy plastic soils on gently sloping to sloping uplands. The soils were derived from basic rock, such as hornblende gneiss and chloritic schist, but are now strongly acid. Their limited acreage occurs in small areas over the county.

The Iredell soils have an olive surface soil and light olive-brown plastic clay subsoil. Runoff is medium to rapid, and internal drainage is very slow. Associated with these strongly acid soils are the better drained, less plastic, and redder Mecklenburg soils. The Iredell soils are in the Red-Yellow Podzolic great soil group.

About one-third of the Iredell acreage in this county is in trees. The other two-thirds is almost equally divided between crops and pasture. One soil of the series is mapped in the county.

Iredell soils, eroded sloping phases (6 to 10 percent slopes) (IaC2).—The following describes a profile under forest:

0 to 6 inches, olive friable gravelly sandy loam containing many shotlike iron concretions.
6 to 12 inches, light olive-brown friable gravelly sandy loam; more iron concretions than in layer above.
12 to 22 inches, light olive-brown clay mottled with red; very firm when moist, plastic when wet; extremely hard to break to angular pieces.
22 to 29 inches, olive-gray very firm clay highly mottled with yellow; massive (structureless).
29 inches +, slightly weathered basic rock.

The depth to the olive-gray massive clay ranges from 16 to 29 inches. A small acreage has slopes of 2 to 6 percent, and a very small acreage is severely eroded. These included severely eroded areas have light olive-brown plastic clay at the surface. Also included with these soils are a few areas that are gravelly and stony.

The permeability and internal soil drainage are both slow. Surface runoff is medium to rapid. The available moisture-holding capacity and fertility are low. Tilth and workability are fair to good where the sandy surface soil is present. Tilth is poor in severely eroded areas where the plastic clay is exposed. The gravelly and stony areas further reduce workability.

Use and management.—These soils are highly erodible. The areas that have little or no erosion are suited to some crops. These crops will give fair yields if a soil-conserving rotation is used and other good management is practiced. The more eroded areas have poor tilth, are difficult to conserve, and are more suitable for pasture and hay than for tilled crops. A permanent plant cover or trees would be best for these soils because of their poor tilth, erodibility, shallowness, and heavy texture. Capability unit IIIe–3.

Lloyd series

The Lloyd series is made up of shallow to deep, well-drained soils on the Piedmont upland. The soils were derived from a mixture of basic and acidic rock, such as hornblende, diorite, granite gneiss, and granodiorite. They occur on gently sloping to sloping, narrow to fairly broad ridges and on strongly sloping to steep slopes along the minor streams. The Lloyd soils are widely distributed and account for about 30 percent of the acreage in Chambers County.

The Lloyd soils are closely associated with the Cecil and Davidson soils and resemble both in color. They are also associated with the Appling, which are lighter colored; with the Madison, which are lighter colored and micaceous; and with the Iredell and Mecklenburg soils, which are plastic and heavier in texture.

The Lloyd soils have a dark reddish-brown sandy loam surface soil. Their subsoil is dark-red sandy clay to clay loam. The soils are medium acid. They belong to the Reddish-Brown Lateritic great soil group.

The Lloyd soils are erodible. About 60 percent of their total acreage is severely to very severely eroded. Areas that are shallow or gravelly and stony are common. Nevertheless, some of the soils have a good agricultural potential. Most of the local crops can be grown on all except the severely eroded and strongly sloping areas. As a rule, average yields are a little higher than on the Appling, Cecil, and Madison soils and slightly lower than on the Davidson soils.

The native vegetation was mixed hardwoods and pines. Most of the acreage has been cleared and is used for crops and pasture. A large acreage that was cleared has been withdrawn from cultivation and now supports fair to good stands of loblolly, shortleaf, and slash pines.

Lloyd sandy loam, eroded gently sloping phase (2 to 6 percent slopes) (LeB2).—The following describes a profile of this soil in a cultivated area:

0 to 10 inches, dark reddish-brown friable sandy loam.
10 to 15 inches, dark-red friable sandy clay loam; breaks easily to subangular blocky pieces.
15 to 33 inches, dark-red sandy clay to clay; friable to firm; breaks to subangular blocky pieces but resistance to breakage is slightly greater than in layer above.
33 inches +, basic rock with friable dark-red sandy clay in the crevices and spaces.

This soil has slow to medium surface runoff and medium internal drainage. It is medium acid, low in organic matter, and high in fertility. Permeability is moderately rapid to moderate in the subsoil, which has high capacity to hold water that plants can use.

Use and management.—The soil is well suited to nearly all of the farm crops commonly grown. Most of the acreage is cultivated. Cotton and corn are the chief crops grown. A small acreage is in improved pasture. This soil has good tilth and is easy to work and conserve. The hazard of erosion is slight to moderate.

The soil responds well to good management and can be kept in excellent condition for crop production. It is the best of the Lloyd soils for cultivation. Capability unit IIe–1.

Lloyd sandy loam, eroded sloping phase (6 to 10 percent slopes) (LeC2).—The profile of this soil is similar to that described for Lloyd sandy loam, eroded gently sloping phase. Runoff is higher than on the eroded gently sloping phase, and if the soil is cultivated, there is more risk of erosion. The soil is medium acid, low in organic matter, and high in fertility. Permeability is moderately rapid to moderate in the subsoil. The available water-holding capacity is moderate.

Use and management.—This soil is well suited to nearly all the general farm crops. The tilth is normally good, and high yields can be expected if erosion is controlled and other management is good. The soil is not so well suited to cultivation as Lloyd sandy loam, eroded gently sloping phase. Capability unit IIIe–1.

Lloyd gravelly sandy loam, eroded gently sloping phase (2 to 6 percent slopes) (LdB2).—The following describes a profile of this soil in a cultivated area:

0 to 10 inches, dark reddish-brown friable sandy loam; angular quartzitic and basic rock fragments ½ to 3 inches in diameter are scattered over the surface and imbedded in the soil.
10 to 15 inches, dark-red friable gravelly sandy clay loam; breaks easily to subangular blocky pieces.
15 to 33 inches, dark-red gravelly sandy clay to clay; friable to firm; slightly harder to break to subangular blocky pieces than layer above.
33 inches +, basic rock; dark-red friable sandy clay in spaces between the rocks.

Surface runoff is slow to medium, and internal drainage is medium. The subsoil has moderately rapid to moderate permeability. The soil has moderate capacity to hold water that plants can use. It is high in fertility, low in organic-matter content, and medium acid.

Included with this soil is a small acreage that is shallow to bedrock and stony. These areas are shown by stone symbols on the soil map.

Use and management.—This soil is suited to most of the crops commonly grown in the county. About two-thirds of the acreage is used for row crops, chiefly cotton and corn. A small acreage is in pasture. Tilth and workability are fair, although impaired by the gravel and stone in some places. The hazard of erosion is slight to moderate, but the soil is generally easy to conserve. Since the soil is responsive, high yields can be produced under good management. The gravel and stones may damage farm machinery. Capability unit IIe–1.

Lloyd gravelly sandy loam, sloping phase (6 to 10 percent slopes) (LdC).—The surface soil, though it has been eroded, consists of 6 to 10 inches of loose, porous, very friable, dark-brown gravelly sandy loam. The organic-matter content is high, and the soil is fertile. Surface runoff is slow. The permeability of the subsoil ranges from moderate to moderately rapid. The available moisture-holding capacity is moderate.

Use and management.—Nearly all of this soil is under a mixed stand of hardwoods and pines. The risk of erosion is slight in forested areas, but if the soil is cultivated, it needs careful management. It is productive and would be suitable for many kinds of crops. Capability unit IIIe–1.

Lloyd gravelly sandy loam, eroded sloping phase (6 to 10 percent slopes) (LdC2).—Except for more rapid runoff and greater tendency to erode, this soil is similar to Lloyd gravelly sandy loam, eroded gently sloping phase. Erosion has been active in areas that have

been clean-cultivated, and shallow gullies have formed in places. About one-fourth of the acreage is shallow, and stones more than 10 inches in diameter are scattered over the surface. These stony areas are 15 to 20 inches deep to bedrock in most places.

Use and management.—This soil, particularly in the stony, shallow areas, is less suited to intensive cultivation than the eroded gently sloping phase. If it is cultivated, close-growing sod crops should be on the soil at least 2 years out of 3. A complete water-disposal system and contour tillage are also needed. The stony, shallow areas are better suited to pasture than tilled crops and probably are best suited to trees. The gravel and stones are a moderate hazard to machinery. Capability unit IIIe–1.

Lloyd gravelly sandy loam, strongly sloping phase (10 to 15 percent slopes) (LdD).—The surface layer is 6 to 10 inches deep, high in organic matter, loose, porous, and very friable. Dikes of rock outcrop in places. Runoff is medium to rapid. The soil is high in fertility and has a moderate capacity for holding moisture that plants can use.

Use and management.—Most of the acreage is forested with a mixed stand of hardwoods and pines. Under this cover, the hazard of erosion is slight to moderate. If it were cleared and cultivated, however, the soil would need intensive management. A strong rotation would be needed, preferably one that would keep the soil under deep-rooted perennials 3 years out of 4. The soil can be used for pasture and hay, but if it is not needed for these, it should be left as woodland. Capability unit IVe–1.

Lloyd gravelly sandy loam, eroded strongly sloping phase (10 to 15 percent slopes) (LdD2).—This soil has a slightly thinner surface soil than the eroded gently sloping phase of Lloyd gravelly sandy loam. It is also slightly shallower, or 15 to 30 inches deep to rock. Dikes of rock outcrop at the surface. Runoff is rapid, and sheet and gully erosion are active and difficult to control. The soil is productive under good management and is fairly easy to work.

Use and management.—Because of strong slopes and erodibility, this soil is of limited value for cultivated crops. Under intensive management, however, good yields of many kinds of crops can be obtained. A sod-forming or close-growing crop should be kept on the soil 3 years out of 4. Capability unit IVe–1.

Lloyd gravelly sandy loam, moderately steep phase (15 to 25 percent slopes) (LdE).—This soil has a thinner surface layer than the eroded gently sloping phase of Lloyd gravelly sandy loam. The depth to rock is 20 to 30 inches. Dikes of rock outcrop at the surface. Runoff is rapid, and internal drainage is slow to medium. Sheet and gully erosion are active and difficult to control. Although this soil is fertile and has good tilth, the moderately steep slopes make the use of machinery difficult.

Use and management.—This moderately steep erodible soil is not suitable for cultivation. It can be used for grasses and legumes grown for pasture and hay. Fair to high yields can be obtained under good management, especially if fertilizer is used. The soil is probably more suitable for trees, especially pine. Capability unit VIe–2.

Lloyd gravelly clay loam, severely eroded gently sloping phase (2 to 6 percent slopes) (LbB3).—The following describes a profile of this soil in a cultivated area:

0 to 5 inches, red friable gravelly sandy clay loam; sticky when wet and hard and crusty when dry.
5 to 29 inches, dark-red firm gravelly clay; hard to break to subangular blocky pieces.
29 inches +, basic rocks, with friable dark-red sandy clay in the spaces between.

The depth to rock is 18 to 36 inches. Permeability and the available moisture-holding capacity are moderate. Runoff is moderately rapid, and less water enters this soil than the sandy loams of the Lloyd series.

This is a fertile soil, although it has little organic matter and is medium acid. If the soil is plowed when wet, clods form that harden or bake on drying. The clods make cultivation difficult, but the gravel in the soil does not seriously interfere with tillage. Sheet and gully erosion are active, and the hazard of erosion is great.

Use and management.—This soil is less suited to intensive cultivation than Lloyd gravelly sandy loam, eroded gently sloping phase. It can be used for some cultivated crops if intensive management is practiced. Liberal use of stable and green manures and the turning under of crop residues will improve the soil. Capability unit IIIe–12.

Lloyd gravelly clay loam, very severely eroded sloping phase (6 to 10 percent slopes) (LbC4).—Erosion has removed all the original surface soil and much of the subsoil. The dark-red, firm, gravelly clay layer has been exposed. Most of the soil is 18 to 30 inches deep to bedrock. In some places, especially where the soil originally was 18 inches or less in depth, the parent rock is exposed. There are many shallow and some deep gullies. Surface runoff is rapid to very rapid. Tilth and workability are extremely poor.

Use and management.—The heavy surface soil, poor tilth, and adverse moisture relations make this soil unsuitable for cultivation. It can be used for grasses and legumes grown for pasture or hay (fig. 9), but intensive management is required. Fertilizer should be used liberally to establish and maintain good stands of close-growing vegetation. Capability unit VIe–2.

Figure 9.—Bahiagrass, foreground, and kudzu, background, on Lloyd gravelly clay loam.

Lloyd gravelly clay loam, severely eroded sloping phase (6 to 10 percent slopes) (LbC3).—Stronger slopes, more rapid surface runoff, and increased erosion hazard distinguish this soil from Lloyd gravelly clay loam, severely eroded gently sloping phase.

Use and management.—This soil is better suited to grasses and clovers for pasture and hay than to crops that require cultivation. Intensive management is needed if the soil is cultivated. Capability unit IVe–10.

Lloyd gravelly clay loam, severely eroded strongly sloping phase (10 to 15 percent slopes) (LbD3).—This soil has stronger slopes, shallower depth to bedrock, more rapid surface runoff, and greater hazard of erosion than Lloyd gravelly clay loam, severely eroded gently sloping phase. It also has poorer tilth and workability and less favorable moisture relations.

Use and management.—This soil is poorly suited to cultivation. If it is cultivated, intensive management is necessary, including a crop rotation that keeps close-growing, deep-rooted perennials on the soil 3 years out of 4. The soil is better for grasses and legumes grown for pasture and hay than it is for tilled crops. Capability unit IVe–10.

Lloyd gravelly clay loam, very severely eroded strongly sloping phase (10 to 15 percent slopes) (LbD4).—Accelerated erosion has removed all of the surface soil down to the firm clay, except in small areas where the surface soil and subsoil were mixed through cultivation. The soil is 18 to 26 inches deep to rock in most places, but the parent rock is exposed in some. Runoff is rapid to very rapid, and little water enters the soil. There are numerous shallow gullies and some deep gullies. Tilth and workability are very poor.

Use and management.—The strong slopes and extremely poor tilth and workability of this soil make it unsuitable for cultivation. Grasses and legumes for pasture and hay can be grown under intensive management, if fertilizer is used liberally. Generally, good stands are difficult to establish and maintain. The soil is probably best suited to trees, preferably loblolly pine. Capability unit VIe–2.

Lloyd gravelly clay loam, severely eroded moderately steep phase (15 to 25 percent slopes) (LbE3).—This soil is 18 to 26 inches deep to rock, and dikes of rock outcrop. Runoff is rapid unless good plant cover is maintained. The soil is fertile, although it has little organic matter. Sheet and gully erosion are active and hard to control. Tilth and workability are poor.

Use and management.—The steep slopes, poor tilth and workability, and severe hazard of erosion make this soil unsuitable for cultivation. With good management, the soil will produce a fair to good growth of grasses and legumes for pasture or hay. The soil is probably more suitable for trees, especially loblolly pine. Capability unit VIe–2.

Lloyd clay loam, severely eroded gently sloping phase (2 to 6 percent slopes) (LaB3).—This soil has no gravel on the surface or in the profile. Otherwise, it is much like Lloyd gravelly clay loam, severely eroded gently sloping phase. It is similar to that soil in depth, moisture relations, tilth, and hazard of erosion.

Use and management.—Because it is not gravelly, this soil is slightly easier to work than Lloyd gravelly clay loam, severely eroded gently sloping phase, but it is suited to the same uses and needs about the same kind of management. Capability unit IIIe–1.

Lloyd clay loam, severely eroded sloping phase (6 to 10 percent slopes) (LaC3).—This soil is similar to Lloyd gravelly clay loam, severely eroded gently sloping phase, but surface runoff is more rapid. Also, it is free of gravel on the surface and in the profile. Sheet and gully erosion are active and hard to control. Although moderately fertile, the soil has poor tilth and is difficult to work.

Use and management.—The more rapid surface runoff, greater hazard of erosion, and poor tilth and workability make this soil less suitable for cultivation than Lloyd gravelly clay loam, severely eroded gently sloping phase. If cultivated, this soil should be in close-growing or sod crops 3 years out of 4. In addition, a complete water-disposal system and contour tillage are suggested. Capability unit IVe–10.

Lloyd stony sandy loam, strongly sloping phase (10 to 15 percent slopes) (LgD).—The following describes a profile of this soil in a forested area:

0 to 8 inches, dark reddish-brown friable sandy loam; stones more than 10 inches in diameter are scattered over the surface.
8 to 14 inches, dark reddish-brown friable sandy clay loam; breaks easily to subangular pieces.
14 to 22 inches, dark-red friable sandy clay; breaks easily to subangular blocky pieces.
22 inches +, partially weathered rocks in a matrix of dark-red sandy clay.

The depth to rock is 14 to 28 inches. Dikes of rock outcrop (fig. 10). Rock fragments occur throughout the profile.

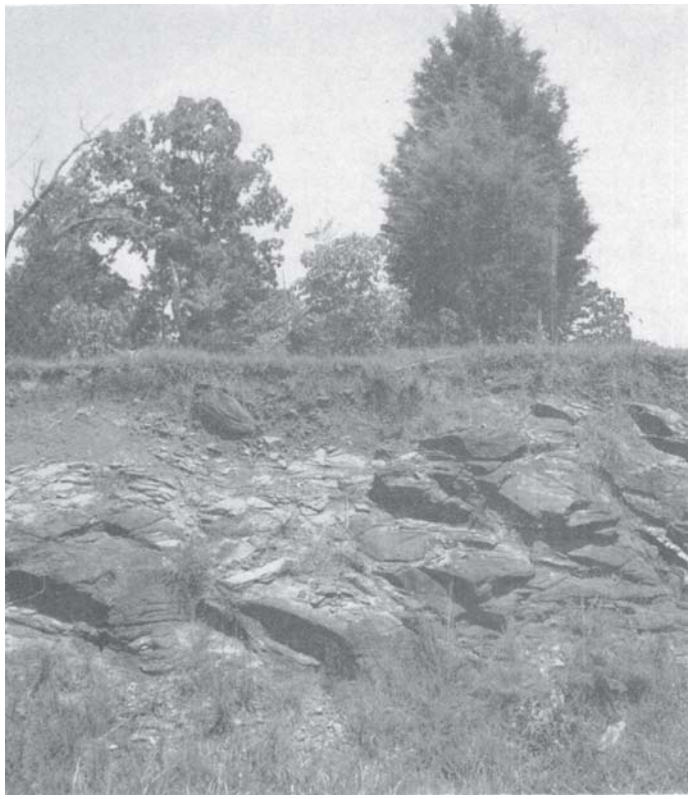

Figure 10.—Road cut through Lloyd stony sandy loam, strongly sloping phase.

Permeability to roots and water is moderate, and the available water-holding capacity is sufficient for most plants. Runoff is moderately rapid. The soil is fertile because the uppermost layer is high in organic matter. The soil is medium acid. Although tilth is good, the soil is extremely difficult to work because of the stones. If cleared, it has a high hazard of erosion.

Use and management.—Almost all of the acreage is forested with a mixed stand of pines and hardwoods. Probably the soil is best used as woodland. Capability unit IVe–5.

Lloyd stony sandy loam, moderately steep phase (15 to 25 percent slopes) (LgE).—The profile is 14 to 25 inches deep to rock. About 23 percent of the acreage is on slopes of more than 25 percent. Moderate permeability and moderate available water-holding capacity make this soil favorable for most forage crops. Runoff is rapid, and the hazard of erosion is moderate. The soil is fertile, and the upper 6 inches is generally high in organic matter. Although the soil has good tilth, it has poor workability because of the stones.

Use and management.—Most of the acreage is forested with hardwoods and pines. A small acreage has been cleared. Some pasture crops can be grown on the less stony parts, but the soil probably is best used as woodland. Capability unit VIe–2.

Lloyd stony clay loam, severely eroded sloping phase (6 to 10 percent slopes) (LfC3).—The following describes a profile of this soil in a forested area:

0 to 6 inches, dark reddish-brown friable sandy clay loam; stones of more than 10 inches in diameter are scattered over the surface.
6 to 18 inches, dark-red friable sandy clay; breaks easily to subangular blocky pieces.
18 inches +, partly weathered rock; dark-red friable sandy clay fills the spaces among the rocks.

The soil is 14 to 24 inches deep to rock. Stones are imbedded throughout the profile. Dikes of rock outcrop. A small acreage is on slopes of 2 to 6 percent.

Permeability is moderate, and the soil has moderate capacity to hold water available to plants. Runoff is moderately rapid. This soil is moderately fertile, medium acid, and low in organic matter. The tilth is poor, and the soil is hard to work. Its stony surface soil is hard and crusted when dry and sticky when wet. Sheet and gully erosion are active.

Use and management.—This soil is not suitable for cultivation. It is stony and shallow and has a clayey surface layer that is difficult to work. Some areas could be pastured, but a sod cover that will protect the soil is difficult to establish and maintain. Probably it is best to use this soil for trees, especially loblolly pine. Capability unit VIIe–2.

Lloyd stony clay loam, severely eroded strongly sloping phase (10 to 15 percent slopes) (LfD3).—This soil is similar to Lloyd stony clay loam, severely eroded sloping phase. It differs largely in that it has stronger slopes, more rapid surface runoff, less infiltration of water, and a shallower profile. Erosion is a severe hazard. The depth to rock is 14 to 21 inches. The soil is extremely difficult to work.

Use and management.—The soil is not suitable for cultivation or pasture, because it is strongly sloping, stony, and shallow. It is probably best suited to trees, especially loblolly pine. Capability unit VIIe–2.

Lloyd gravelly clay loam, severely eroded sloping shallow phase (6 to 10 percent slopes) (LcC3).—The following describes a profile of this soil in a wooded area:

0 to 6 inches, dark reddish-brown gravelly sandy clay loam; slightly sticky when wet, friable when moist, hard when dry; breaks easily to subangular blocky pieces.
6 to 14 inches, red friable sandy clay; breaks easily to subangular blocky pieces.
14 inches +, partly weathered basic rocks; red friable sandy clay in the spaces between the rocks.

The depth to rock ranges from 12 to 20 inches. Gravel occurs on the surface and in the profile. Dikes of rock outcrop. A small acreage on 2 to 6 percent slopes is included.

Permeability is moderate, but the available water-holding capacity is low. Runoff is rapid, and sheet and gully erosion are active. Although low in organic matter, the soil is moderately fertile. It is medium acid.

Use and management.—This soil is not suitable for cultivation. It is shallow, droughty, poor in tilth, and difficult to work. Under intensive management, pasture and hay produce fair to good yields. Probably it is best to use the soil as woodland, because loblolly pines grow rapidly on it. Capability unit VIIe–2.

Lloyd gravelly clay loam, severely eroded strongly sloping shallow phase (10 to 15 percent slopes) (LcD3).—This soil is slightly shallower than Lloyd gravelly clay loam, severely eroded sloping shallow phase. The depth to rock ranges from 12 to 18 inches. A small acreage has slopes of 12 to 25 percent, but the dominant range in slope is 10 to 15 percent. Runoff is very rapid. Unless a good cover is maintained, little water infiltrates. Sheet and gully erosion are active and hard to control.

Use and management.—This soil is not suitable for cultivation, because it is strongly sloping and shallow and extremely poor in tilth and workability. Pasture and hay can be grown under good management, but stands are difficult to establish and maintain. Probably this soil is best suited to trees, especially loblolly pine. Capability unit VIIe–2.

Louisa series

The Louisa series consists of very shallow to shallow, well-drained, strongly acid soils on the Piedmont upland. They were derived from mica schist and quartz mica schist. The soils are strongly sloping to steep; only a small acreage is sloping. They have a brown friable surface soil. Their yellowish-red very friable sandy clay loam subsoil is thin and weakly developed. Stones and gravel are common.

These soils are in the northwestern and southeastern corners of the county with the deeper, better developed Madison soils. The Louisa soils are in the Lithosol great soil group.

The native vegetation was a mixed stand of hardwoods and pines. The Louisa soils cover about 3,000 acres, nearly all of which is in hardwoods and second-growth pines.

Louisa gravelly sandy loam, moderately steep and steep phases (15 to 25+ percent slopes) (LhE).—The

following describes a profile of this soil in a forested area:

0 to 4 inches, brown very friable sandy loam.
4 to 10 inches, yellowish-red, very friable sandy clay loam; contains many mica flakes; breaks easily to subangular blocky pieces.
10 inches +, partly weathered quartz mica schist.

The depth to the schist is 6 to 15 inches. Small acreages of this soil are sloping to strongly sloping. Angular fragments of schist and quartz, generally less than 3 inches in diameter, are scattered over the surface and imbedded in the profile. In areas that have never been cleared, the sandy loam surface soil is 6 to 10 inches thick and high in organic matter. Other areas are low in organic matter.

This soil has moderate permeability but a low capacity for holding moisture that plants can use. Runoff is moderately rapid, and sheet and gully erosion are active on areas that have a poor plant cover. This soil is low in fertility and strongly acid. It has fairly good tilth.

Use and management.—This steep, shallow, droughty soil is best suited to forest. Pine grows well, as the roots penetrate deeply into much of the partly weathered schist material. Capability unit VIIe–2.

Louisa stony sandy loam, steep phase (25+ percent slopes) (LkF).—This soil has schist and quartz fragments more than 10 inches in diameter scattered over the surface and imbedded in the profile. About 41 percent of the acreage is on slopes of more than 25 percent; 33 percent on slopes ranging from 15 to 25 percent; 20 percent on slopes of 10 to 15 percent; and 6 percent on slopes of 6 to 10 percent.

The soil has moderate permeability but a low capacity to hold moisture that plants can use. Runoff is moderately rapid, and sheet and gully erosion are active on areas without plant cover. The soil is low in fertility and strongly acid. Although tilth is good, the workability is poor because of the stone fragments.

Use and management.—The use of this soil is limited to timber production by its steep slopes, poor moisture relations, and stony and shallow nature. Pine grows well because the roots penetrate deeply into much of the partly weathered schist. Capability unit VIIe–2.

Louisburg series

The Louisburg series consists of very shallow to shallow, well-drained soils on the Piedmont upland. They have developed from granite and granite gneiss. They are sloping to steep and in close geographic association with the Cecil and Appling soils.

The Louisburg soils have a light-gray to light brownish-gray friable sandy loam surface soil and a yellowish-brown to pale-yellow sandy clay subsoil, which is thin and friable. The profile development is weak, and the parent rock is exposed in places. The series belongs to the Lithosol great soil group.

The native vegetation was mixed hardwoods and pines. Most of the acreage is used as woodland; a small part is used for pasture, hay, and cultivated crops.

Louisburg stony sandy loam, sloping phase (6 to 10 percent slopes) (LmC).—The following describes a profile of this soil in an idle area:

0 to 6 inches, light-gray to light brownish-gray very friable sandy loam; cobblestones and stones 3 to 24 inches in diameter are scattered over the surface.
6 inches +, slightly weathered granite and gneiss.

The soil ranges from 4 to 12 inches deep to bedrock. Rock outcrops in many areas. There is a weakly defined subsoil in some places, a yellowish-brown to pale-yellow friable sandy clay that ranges from 2 to 4 inches in thickness.

This soil is very rapidly permeable to water but its capacity for holding water for plants is very low. Fertility is also low. In wooded areas the organic-matter content is moderately high. The soil is strongly acid. The risk of erosion is high if a good plant cover is not maintained. Included with this soil are some areas that are eroded.

Use and management.—This stony, shallow, droughty soil is best used as woodland. Generally, the trees grow well. Their roots follow crevices in the bedrock and reach down several feet in many places. The stones on this soil would make cultivation or mowing very difficult. Capability unit IVe–5.

Louisburg stony sandy loam, moderately steep and steep phases (15 to 25+ percent slopes) (LmE).—About half of this mapping unit is on slopes of 10 to 15 percent; the rest is on slopes exceeding 15 percent. Runoff is rapid; and, in areas without vegetation, erosion is active and very difficult to control. Some areas are severely eroded. In places bedrock is exposed. Some gullies have cut down to the partly weathered rock.

Use and management.—Strong slopes, stoniness, shallow depth, and active erosion limit use of this mapping unit to forest. Capability unit VIIe–2.

Madison series

The Madison series consists of moderately deep to deep, well-drained soils on the Piedmont upland that have developed from mica schist and quartz mica schist. They are gently sloping to steep and occur with the darker red Lloyd, the lighter colored Appling, the less micaceous Cecil, and the shallow Louisa soils.

The Madison soils have a reddish-brown to brown friable surface soil and a dark-red clay loam to clay subsoil that is friable to firm. They are strongly acid. These soils are in the Red-Yellow Podzolic great soil group.

The native vegetation was mixed hardwoods and pines. Most of the acreage has been cleared, except for that on the steep slopes. About one-third of this cleared acreage now grows pasture and cultivated crops. The other two-thirds has been withdrawn from cultivation and now supports fair to good stands of mixed pines, mostly loblolly.

Madison gravelly fine sandy loam, eroded gently sloping phase (2 to 6 percent slopes) (McB2).—The following describes a profile of this soil in a cultivated area:

0 to 4 inches, brown very friable fine sandy loam; in most areas angular quartz and platy schist fragments are scattered over the surface.
4 to 9 inches, red friable sandy clay loam; contains some mica flakes; breaks easily to subangular blocky pieces.
9 to 28 inches, dark-red friable to firm clay; contains much mica; slightly harder to break to subangular blocky pieces than layer above.
28 to 38 inches, dark-red very friable clay loam; contains

more mica than layer above; breaks easily to subangular blocky pieces.
38 to 40 inches +, partly weathered mica schist and highly micaceous, dark-red friable clay.

This soil is 26 to 50 inches deep to the partly weathered parent material. The depth to bedrock varies widely, and dikes protrude into the upper subsoil in many places.

This soil is permeable to roots and moisture and has a moderate available moisture-holding capacity. Although highly fertile, it is low in organic material and strongly acid. The gravel fragments do not hinder cultivation to a great extent. The soil has good tilth and is easily worked and conserved.

Use and management.—This soil is suited to many kinds of crops and will produce high yields under good management. Since the hazard of erosion is moderate, the cultivated soil needs a complete water-disposal system, contour tillage, and rotations that provide a good plant cover at least half of the time. Capability unit IIe–1.

Madison gravelly fine sandy loam, eroded sloping phase (6 to 10 percent slopes) (McC2).—Runoff is more rapid than on the eroded gently sloping phase of Madison gravelly fine sandy loam, unless a good ground cover is maintained. Erosion is a moderate hazard. A small acreage has stones more than 10 inches in diameter on the surface, but these can be removed easily. These areas are shown on the soil map by stone symbols.

Use and management.—Because this soil has stronger slopes and more rapid surface runoff than the eroded sloping phase, it needs more intensive management if it is cultivated. Under good management, it is highly productive of many kinds of crops. If cultivated, the soil needs a complete water-disposal system and a crop rotation that provides close-growing sod crops 2 years out of 3. Capability unit IIIe–1.

Madison gravelly fine sandy loam, eroded strongly sloping phase (10 to 15 percent slopes) (McD2).—This soil is not so deep as Madison gravelly fine sandy loam, eroded gently sloping phase. It is 26 to 42 inches deep to the parent material. It includes a small acreage in which stone fragments more than 10 inches in diameter are scattered over the surface. These areas are shown on the soil map by stone symbols.

Runoff is moderately rapid, but enough water infiltrates to meet the needs of most plants during an average season. Erosion is a moderate to severe hazard unless a good ground cover is maintained. The strong slopes impede cultivation.

Use and management.—Strong slopes and the risk of erosion make this soil less suitable for cultivation than the eroded gently sloping phase. Intensive management is needed to maintain tilth and workability, and to produce good yields. A rotation is suggested that will keep the soil in close-growing sod crops, preferably deep-rooted perennials, 3 out of 4 years or 4 out of 6 years. Capability unit IVe–1.

Madison gravelly fine sandy loam, moderately steep phase (15 to 25 percent slopes) (McE).—This soil has a 4- to 8-inch fine sandy loam surface layer that is dark brown, loose, porous, and high in organic matter. The parent material is at depths of 25 to 40 inches. Runoff is rapid, and sheet and gully erosion are active in exposed areas. The soil has good tilth, but the steep slopes make it difficult to work.

Small acreages have stones more than 10 inches in diameter scattered over the surface. These areas are shown on the soil map by stone symbols. Also included are small acreages on slopes of more than 25 percent.

Use and management.—Almost all of the acreage of this soil is in trees. If the soil were cleared, close-growing or sod-forming crops would be needed to maintain and conserve it. The soil is productive of hay and pasture under good management, especially if fertilized. This soil is suited to trees, and pines grows well. Capability unit VIe–2.

Madison gravelly clay loam, severely eroded sloping phase (6 to 10 percent slopes) (MbC3).—The following describes a profile of this soil in a cultivated area:

0 to 5 inches, red friable gravelly clay loam that contains mica flakes; breaks easily to subangular blocky pieces.
5 to 25 inches, dark-red friable to firm clay; contains more mica flakes than layer above; harder to break to subangular blocky pieces.
25 to 34 inches, dark-red very friable clay loam; contains more mica than layer above; breaks easily to subangular blocky pieces.
34 to 38 inches +, partly weathered mica schist and highly micaceous dark-red friable clay.

The profile is 24 to 45 inches deep to the parent material. The depth to schist rock varies, and dikes protrude to or near the surface in many places. The soil contains a small acreage that is stony and that is shown on the soil map by stone symbols.

Permeability and available water-holding capacity are moderate. Runoff is more rapid than on the less eroded phases. This soil is moderately fertile but low in organic matter and strongly acid. The surface soil is slightly sticky when wet and hard when dry. It has poor tilth and is difficult to work. Erosion is a moderate to severe hazard.

Use and management.—This soil is not suited to intensive cultivation, because of its heavy nature and poor tilth and workability. If it is cultivated, good management is needed. The management plan should include a water-disposal system that provides sodded outlets, contour tillage, and crop rotations in which close-growing crops and sod crops are dominant. Capability unit IVe–10.

Madison gravelly clay loam, very severely eroded sloping phase (6 to 10 percent slopes) (MbC4).—Erosion has removed all, or almost all, of the friable sandy clay loam surface soil. Remnants of the original surface soil have been mixed with the firm clay of the subsoil to form a moderately heavy surface layer. This layer is sticky when wet, friable to firm when moist, and hard when dry.

Permeability is moderate, internal drainage is medium, and surface runoff is rapid. Sheet erosion is active, and some deep gullies have formed. Tilth and workability are poor.

Use and management.—The clayey surface layer, poor tilth and workability, and severe hazard of erosion make this soil unsuitable for cultivation. Fairly good yields of grass-legume pasture can be produced under good management. Heavy fertilization is necessary.

Good stands of pasture or hay are difficult to establish and maintain, however, and it is probably better to use the soil for loblolly, shortleaf, or similar species of pine. Capability unit VIe–2.

Madison gravelly clay loam, severely eroded strongly sloping phase (10 to 15 percent slopes) (MbD3).—This soil is 22 to 40 inches deep to the parent material. It includes small acreages where stones more than 10 inches in diameter are scattered over the surface. These areas are shown on the soil map by stone symbols.

Surface runoff is rapid, and internal drainage is medium. Sheet and gully erosion are active and hard to control. There are some deep gullies. Moisture relations, tilth, and workability are generally poor.

Use and management.—Grasses and legumes can be grown for hay and pasture if management is good. The soil is not suitable for cultivation. A good stand of pasture or hay is difficult to establish and maintain because of the poor tilth of the soil and its unfavorable moisture relations. Probably this soil is best used as woodland. Capability unit VIe–2.

Madison gravelly clay loam, very severely eroded strongly sloping phase (10 to 15 percent slopes) (MbD4).—All or almost all of the friable clay loam surface soil has been removed through erosion, and the rest has been mixed with the firm clay of the subsoil. The present surface layer is moderately heavy; it is sticky when wet, friable to firm when moist, and hard when dry.

Permeability of this soil is moderate, and surface runoff is rapid to very rapid. Sheet and gully erosion are very active. Some gullies are too deep to cross with machinery. Tilth is poor, and the soil is extremely difficult to work.

Use and management.—This soil should not be cultivated. It is best used as woodland. Loblolly pine grows well. Capability unit VIIe–1.

Madison gravelly clay loam, severely eroded moderately steep phase (15 to 25 percent slopes) (MbE3).—This soil is 20 to 36 inches deep to the parent material. It includes a small acreage where stones more than 10 inches in diameter are scattered over the surface. The stony areas are shown by symbols on the soil map.

The soil is moderately permeable, and runoff is rapid to very rapid. Little rainfall infiltrates unless a good ground cover is maintained. Sheet and gully erosion are active and very difficult to control. Some deep gullies have formed.

Use and management.—This soil is suitable only for trees or for some kind of permanent plant cover that will protect it from further erosion. Capability unit VIe–2.

Madison clay loam, severely eroded gently sloping phase (2 to 6 percent slopes) (MaB3).—This soil differs from Madison gravelly clay loam, severely eroded sloping phase, mainly in being free of gravel and in having poorer tilth and workability. Surface runoff is rapid. The hazard of erosion is great. The soil is moderately fertile, though low in organic matter and strongly acid.

Use and management.—This soil is less suitable for cultivation than Madison gravelly clay loam, severely eroded sloping phase. Nevertheless, a fairly wide range of crops will produce good yields under good management. A complete water-disposal system and adequate crop rotations are needed. The soil is well suited to grasses and legumes grown for pasture and hay. Capability unit IIIe–12.

Madison soils, sloping graphitic phases (6 to 10 percent slopes) (MdC).—These soils differ from the Madison gravelly fine sandy loams in having a reddish-brown rather than a brown surface soil, finer mica flakes in the profile, graphitic schist and slate in the parent rock, and a few partially weathered fragments of schist and slate throughout the profile. The following describes a profile in a forested area:

0 to 4 inches, reddish-brown to brown very friable sandy loam.
4 to 9 inches, light yellowish-brown very friable gravelly fine sandy loam.
9 to 14 inches, strong-brown to red friable sandy clay loam; breaks easily to subangular blocky pieces.
14 to 24 inches, red friable sandy clay; breaks easily to subangular blocky pieces; contains fine mica flakes.
24 to 28 inches +, mixture of partly weathered rock and red friable sandy clay.

The profile is 16 to 32 inches deep; depth varies considerably because dikes of rock extend upward in the soil. Permeability to moisture and roots is moderate. The soils have moderate capacity to hold water that plants can use. Although they are high in fertility, they are low in organic matter and strongly acid. Angular fragments of schist and quartz occur in the soils and on the surface. The tilth is good, and the soils are fairly easy to work.

Use and management.—Most of the acreage is in forest, but these soils would be productive under good management. If they were cultivated, terraces, contour cultivation, and a water-disposal system with vegetated waterways would be required. Also, a rotation would be needed that would keep the soils in thick-growing crops 2 years out of 3, or preferably 4 years out of 6. Capability unit IIIe–1.

Madison soils, eroded strongly sloping graphitic phases (10 to 15 percent slopes) (MdD2).—These soils have a thinner surface layer than the Madison soils, sloping graphitic phases. The surface layer also contains more rock fragments. These soils are 15 to 28 inches deep to the parent material. Included are some areas on slopes of 15 to 25 percent that are more severely eroded. About a third of the acreage is on slopes of more than 25 percent.

Runoff is rapid. Sheet and gully erosion are active and hard to control where a good plant cover is not maintained.

Use and management.—Almost all of the acreage is in forest. Strong slopes and erosion hazard limit use of the soils, but good yields of many crops could be produced under careful management. If the soils are cultivated, they should be kept in close-growing, deep-rooted perennials at least 3 years out of 4, and preferably 6 years out of 8. Capability unit IVe–1.

Mecklenburg series

The Mecklenburg series consists of gently sloping to sloping moderately well drained soils on the Piedmont upland. They are moderately deep to deep and have developed in materials weathered mainly from diorite,

gabbro, and hornblende schist. The largest acreages are in the north-central part of the county. The Mecklenburg soils are associated with the heavier and more plastic Iredell soils and the more friable and lighter textured Lloyd soils.

The surface soil of the Mecklenburg series is a yellowish-red to reddish-brown, firm to friable clay loam to loam or sandy loam. The subsoil is red clay, which is firm when moist and slightly plastic when wet. The profile is medium acid. The Mecklenburg soils belong to the Red-Yellow Podzolic great soil group.

The native vegetation was mixed hardwoods and pines. Almost all of the acreage was once cleared. About half of this cleared area is cultivated or in hay crops. Most of the remaining half has been withdrawn from production and returned to forest. There are also some small areas that are idle or in pasture. Only one unit of the series is mapped.

Mecklenburg clay loam, severely eroded sloping phase (6 to 10 percent slopes) (MeC3).—The following describes a profile of this soil in a native grass hayfield:

0 to 6 inches, reddish-brown firm clay loam; moderately hard to break to subangular blocky pieces.
6 to 21 inches, red clay; firm when moist, slightly plastic when wet; hard to break to subangular blocky pieces.
21 to 30 inches, yellowish-red, firm, slightly plastic clay faintly mottled with yellow; hard to break to subangular blocky pieces.
30 to 40 inches, yellowish-red, firm, massive clay mottled with yellow.

The profile is 24 to 38 inches deep to massive clay. Fragments of basic rock less than 3 inches in diameter are scattered over the surface in most places. Also, there are a few stones 10 inches or more in diameter.

Included with this soil are a few small areas in which the surface soil is a yellowish-red friable sandy loam or loam, 5 to 8 inches thick. Also included are small areas on slopes of 2 to 6 percent.

The soil is slowly permeable. Its available moisture-holding capacity is moderate. Surface runoff is moderately rapid to rapid. Although the soil is moderately fertile, it is low in organic matter and medium acid. Tilth and workability are poor. The soil is sticky when wet, firm when moist, and hard when dry. Sheet erosion is active. Some gullies are too deep to cross with machinery.

Use and management.—Erosion hazard and poor tilth make this soil poor for cultivated crops. Grasses and clovers grown for hay or pasture generally produce good yields if they are properly managed. Johnsongrass makes excellent growth and thrives in the idle areas and in pastures. Capability unit IVe–2.

Rock land

Rock land (6 to 25 percent slopes) (Ro) has granite and gneiss outcrops on at least three-fourths of its surface (fig. 11). Where rock outcrops are not visible, a very shallow, coarse, sandy soil supports a sparse stand of redcedar. This miscellaneous land type is associated with the Louisburg and Appling soils. The acreage is limited, and the land is of little or no agricultural value. Capability unit VIIIs–1.

Rough broken land

Rough broken land (2 to 25+ percent slopes) (Rb) is cut up by many small to large V-shaped valleys and bordering narrow ridgetops. It is steep to very steep. The sandy loam to stony sandy loam soil material is generally shallow and was derived from a mixture of acidic and basic rock. In small areas, profiles of Cecil, Lloyd, Madison, and Appling soils can still be recognized.

Use and management.—All of this miscellaneous land type is in forest, chiefly hardwoods. In a few places there are good to excellent stands of pine. Capability unit VIIe–2.

Stony land

Stony land (6 to 25 percent slopes) (Se) is a miscellaneous land type. From one-half to three-fourths of its acreage is covered with stones 10 to 48 inches or more in diameter. These stones are also imbedded throughout the profile. Outcrops of basic and acidic bedrock occur in many places. The relief is gently sloping to very steep. This land type is well drained to excessively drained near the surface, but internal drainage is slow where the subsoil is heavy. The principal soils associated with this land type are the Cecil, Appling, Louisburg, Lloyd, and Iredell.

This land is best suited to forest, although some of the less stony parts would make fair pasture. Nearly all of the land now has fair to good stands of mixed hardwoods and pines. Capability unit VIIe–2.

Sandy alluvial land, poorly to somewhat poorly drained

Sandy alluvial land, poorly to somewhat poorly drained (0 to 2 percent slopes) (Sa) is a miscellaneous land type consisting of sediments recently washed down from the Piedmont upland. It occurs on nearly level, narrow to moderately wide floodplains along all of the streams. Although this land is in close geographic association with the Congaree and Chewacla soils, it is a mixture of soil materials, not a definite kind of soil. It is ordinarily sandy, but the texture varies

Figure 11.—Vertical cut through granite in Rock land, a miscellaneous land type.

according to the source of material and the force of the overflowing waters.

Additional sediments have been deposited so recently that a soil profile has not developed. Generally, there is 4 to 8 inches of moderately well drained loam, sandy loam, or loamy sand, which is friable and dark reddish brown to light yellowish brown. Under this layer are mixed sandy, silty, and clayey materials that are poorly drained and highly mottled with gray, brown, and yellow. The mottling normally extends downward 40 inches or more and increases with depth.

The sediments are deposited during the frequent floods brought by heavy rains. The water table is 12 to 18 inches from the surface in wet seasons and at depths of 36 to 48 inches in dry seasons.

Use and management.—This land occupies 44,000 acres, and about 88 percent of it is covered with alders, willows, and similar water-tolerant growth. The remaining acreage is about equally divided as cropland, idle land, and pasture. Because of periodic overflows, poor drainage, and variation in soil texture, only a small part of the total acreage is suitable for cultivation. If it were adequately drained, much of this land would produce fair to good pasture. Capability unit IVw–1.

Seneca series

The Seneca series consists of moderately deep, well-drained soils. Their parent material was local alluvium recently washed or moved down from other Piedmont soils, such as the Appling or Cecil. They occur on nearly level to gently sloping relief along the first bottoms and heads of minor streams and at the base of slopes.

The Seneca soils are scattered in small plots, generally 1 to 3 acres in size, but they are important agriculturally. They are related to the redder and browner Starr soils and, in limited extent, to the poorly drained Worsham soils. The Seneca soils are in the Alluvial great soil group. Only one soil of the Seneca series is mapped in Chambers County.

Seneca sandy loam (0 to 6 percent slopes) (Sb).—The following describes a profile of this soil in a pasture:

0 to 21 inches, light yellowish-brown very friable sandy loam.
21 to 30 inches, yellowish-brown, friable, light sandy clay loam; breaks easily to subangular blocky pieces.
30 to 40 inches +, yellow sandy clay weathered from parent rock.

The soil ranges from 21 to 36 inches in depth to the sandy clay that weathered from the parent rock. In some areas the soil is uniform throughout the profile; that is, there are no differences in color and texture of the layers.

This soil generally occurs at the base of slopes, along intermittent drains and, to lesser extent, along permanent streams. In many places it consists of mixed alluvial and colluvial deposits.

Surface runoff is slow to medium, and internal drainage is medium. The soil has moderately rapid permeability down to the layer that formed from material weathered from the underlying rock. The soil is moderately fertile and highly productive but is generally low in organic matter. The profile is strongly acid. Tilth and workability are good.

Use and management.—This soil has few limitations. It is suited to many kinds of crops and produces high yields under good management. In some places terraces or channels are needed to divert excess runoff on the slopes above this soil. Most of this soil is cultivated or in pasture. Capability unit I–1.

The acreage is used as follows:

Use:	*Percentage of total acreage*
Cropland	54
Woodland	18
Pasture	12
Idle land	16

Shallow land

Shallow land is mapped in two units, sloping, and strongly sloping. The soils of these units are too shallow and mixed to be classed with any series. They are well drained and were derived from the Piedmont upland. Areas are scattered over the county and generally are less than 10 acres in size. The total area of both units is less than 3 square miles. The units of Shallow land are associated with the Lloyd, Mecklenburg, Iredell, and Helena soils and contain small areas of those soils.

In about half of the acreage, stones 10 inches or more in diameter are scattered over the surface and imbedded in the soil. The shallow mantle of surface soil, 5 to 12 inches deep to the partly weathered rock, is an olive to dark reddish-brown loam to sandy loam. Less than half the acreage has a weakly developed thin subsoil of sandy clay to clay texture. Surface runoff is medium to rapid.

About 65 percent of the acreage is forested with hardwoods and second-growth pines. The rest is about equally divided as cultivated, pastured, and idle land.

Shallow land, sloping (6 to 10 percent slopes) (ScC) has moderate to slow permeability and very low available moisture-holding capacity. Its fertility and organic-matter content are low, acidity is medium to strong, and tilth and workability are poor. Stones are common. The hazard of erosion is moderate to severe, especially if a good plant cover is not maintained. This unit includes small areas with slopes of 2 to 6 percent.

Use and management.—This shallow, droughty land has poor moisture relations and is subject to moderate to severe erosion. It is best suited to grasses and legumes grown for pasture. The less stony areas can be used for hay. If this land is needed for row crops, the better areas can be cultivated 1 year out of 4. Capability unit IVe–2.

Shallow land, strongly sloping (10 to 15 percent slopes) (ScD).—The soil mantle is 4 to 9 inches deep to the partly weathered rock. Gravel, stone, and rock fragments are numerous. Surface runoff is rapid to very rapid, and erosion is a severe hazard. There are many gullies, some of which have cut down to the partially weathered underlying rock. This unit includes a small acreage on slopes as steep as 25 percent.

Use and management.—This land is best suited to forest because it is strongly sloping, shallow, droughty, and easily eroded. Capability unit VIIe–2.

Starr series

The Starr series consists of soils that are moderately deep to deep, well drained, and dark brown to dark reddish brown. They are developing on recent deposits washed or moved down from the Cecil, Madison, Lloyd, and Davidson soils. They occur in nearly level to gently sloping areas along the first bottoms and at the heads of minor streams and at the base of slopes. No normal profile has developed.

The Starr soils are scattered throughout the county but are important agriculturally. They are associated with the yellow Seneca and the poorly drained Worsham soils. The Starr soils are classed with the Alluvial great soil group. Only one soil is mapped in the county.

Starr soils (0 to 6 percent slopes) (Sd).—The following describes a profile in a pastured area:

0 to 24 inches, dark reddish-brown friable loam; gradual transition to layer below.
24 to 36 inches, dark reddish-brown very friable sandy loam; breaks easily to a crumbly mass.
36 to 46 inches +, olive-brown very friable loamy sand.

The surface soil varies from brown to dark red in color and from very fine sandy loam to clay loam in texture. The soil is 24 to 42 inches deep to the older underlying material. This older material, which has been buried by overwash, is variable. In some places it is residual material similar to that of the nearby higher lying soils, and in others it is alluvial-colluvial material.

The soils are permeable to a depth of several feet. Surface runoff is slow to medium. Erosion is a hazard only where drainage channels have cut down, enlarged, and formed deep gullies. Fresh accumulations of soil material are deposited during heavy rains.

These soils are fertile and productive. They are generally low in organic matter. Their profile is medium acid. Tilth is favorable, and the soils are easy to work.

Use and management.—Starr soils have few limitations. They are suited to many kinds of crops and produce good yields if well managed. Diversion terraces are needed in places to divert excess runoff on the upland soils nearby. Much of the acreage of the Starr soils is cultivated or in pasture. Capability unit I–1.

The acreage of the Starr soils is used as follows:

Use:	*Percentage of total acreage*
Cropland	42
Woodland	24
Pasture	20
Idle land	14

Talladega series

The Talladega series consists of very shallow to shallow, well-drained upland soils. They were derived from sericitic schist and graphitic schist, and in a few places from dikes of quartzite. The soils occur on sloping to steep relief in the northwestern corner of the county. They occur with the micaceous Louisa soils and the deeper Madison soils.

The surface soil is a brown friable sandy loam. The subsoil is a strong-brown friable sandy loam. Nearly all areas are gravelly, and some are stony. The profile is strongly acid. The Talladega series belongs to the Lithosol great soil group.

The native vegetation is a mixed stand of hardwoods and pines. Only one soil of the series is mapped in the county.

Talladega gravelly loam, moderately steep phase (15 to 25 percent slopes) (TaE).—The following describes a profile of this soil under virgin forest:

0 to 6 inches, brown to dark-brown gravelly loam to sandy loam; very friable, and high in organic matter.
6 to 10 inches, strong-brown gravelly sandy loam; very friable.
10 inches +, partly weathered metamorphic rock.

The profile is 6 to 16 inches deep to the partly weathered rock. In some areas, 2 to 6 inches of a red friable sandy clay loam subsoil occurs just above the parent material. Some small areas have slopes of 6 to 15 percent.

Surface runoff is medium to rapid, and permeability is moderately rapid. The soil has a low available moisture-holding capacity. The soil is strongly acid and low in fertility. Gravel and stones are common.

Use and management.—The moderately steep slopes, shallow and droughty nature, and poor physical condition make this soil best suited to forest. Loblolly pine, and especially longleaf pine, grows well. Capability unit VIIe–2.

Wickham series

The Wickham series consists of moderately deep to deep, well-drained soils. These have developed from old alluvium washed from other Piedmont soils, such as the Cecil, Lloyd, Appling, and Madison. They occur on gently sloping to sloping high stream terraces. A small acreage is on strong slopes. In this county their limited acreage is located mostly along the Tallapoosa and Chattahoochee Rivers in association with the darker red Hiwassee and the lighter colored Altavista soils.

The surface soil of the Wickham series is a brown friable fine sandy loam. The subsoil is a red, friable to firm, sandy clay loam to clay. The Wickham soils belong to the Red-Yellow Podzolic great soil group.

The total acreage is used as follows: 28 percent for cultivated crops; 38 percent for pines and hardwoods; 16 percent for idle land; and 18 percent for pasture.

Wickham fine sandy loam, eroded sloping phase (6 to 10 percent slopes) (WaC2).—The following describes a profile of this soil in a pasture:

0 to 5 inches, brown friable fine sandy loam.
5 to 11 inches, reddish-brown friable sandy loam.
11 to 19 inches, red friable sandy clay loam; breaks easily to subangular blocky pieces.
19 to 35 inches, red friable to firm sandy clay loam to clay; harder to break to subangular blocky pieces than layer above.
35 inches +, unconsolidated to weakly cemented gravel beds of varying thickness.

A large amount of mica is present in the subsoil in some areas. This appears where the soil was derived from sediments washed from Madison and Louisa soils. The depth to the gravel layer varies; the range in depth is 24 to 60 inches. In some places the gravel is absent and the profile rests on material weathered from underlying rock. In some areas rounded gravel is scattered

over the surface and imbedded in the profile. Included is a small acreage on slopes of less than 6 percent.

The soil is well drained and has moderate to moderately slow permeability. Its capacity to hold water available to plants is moderate. The soil is moderately fertile and responds to fertilizer, but it is low in organic matter. It has good tilth and workability and is easy to conserve under good management. Sheet and gully erosion are active in places where a good plant cover is not maintained.

Use and management.—The good tilth and favorable slopes and moisture relations combine to make this soil suitable for cultivation. Terraces, contour cultivation, and water-disposal systems, with sodded waterways in the natural draws, are needed to control erosion. Crop rotations should provide thick-growing crops 2 years out of 3, or preferably 4 years out of 6. Capability unit IIIe–1.

Wickham fine sandy loam, eroded strongly sloping phase (10 to 15 percent slopes) (WaD2).—This soil occurs on narrow breaks between more level areas and in fairly wide bands on hilly slopes. The profile is somewhat shallower than that described for Wickham fine sandy loam, eroded sloping phase.

The permeability and available water-holding capacity of this soil are moderate. Surface runoff is moderately rapid. The hazard of erosion is moderate.

Most of the acreage on the narrow breaks is in forest, which is probably the best use. The wide slopes are in pasture or cultivated crops.

Use and management.—Strong slopes and hazard of erosion make this soil less suitable for cultivated crops than for perennial crops grown for pasture and hay. Capability unit IVe–1.

Worsham series

The Worsham series consists of poorly drained soils derived from granite, gneiss, and schist. The parent material also includes local alluvial and colluvial material washed down from nearby slopes. The soils are on nearly level to gently sloping relief in small areas at the heads of minor streams, at the base of slopes, and in small depressions. They are associated with the Appling, Cecil, Colfax, Durham, Seneca, and Starr soils.

In most places water seeping from the adjacent slopes causes the Worsham soils to be wet throughout the year. The surface soil is a light yellowish-brown friable sandy loam, and the subsoil is a gray and yellow clay and sandy clay. The profile is strongly acid. The series is classed with the Alluvial great soil group. Only one soil of the series is mapped in this county.

Worsham sandy loam (0 to 2 percent slopes) (Wb).—The following describes a profile of this soil in a wooded area:

0 to 6 inches, light yellowish-brown very friable sandy loam.
6 to 13 inches, olive-brown friable sandy loam faintly mottled with yellow.
13 to 30 inches, gray clay mottled with yellow; mottling increases with depth; friable when moist and slightly plastic when wet; breaks to fine and medium subangular blocky pieces; contains alluvial and residual material.
30 to 40 inches +, strong-brown, yellow, and gray sandy clay with strong mottlings of light gray in gray; massive (structureless); gradual transition to partly weathered granite and gneiss at 50 to 65 inches.

Runoff is slow to very slow. Permeability is slow to very slow in the subsoil.

Use and management.—A large part of the acreage is in water-tolerant trees, such as alder and willow. Although the soil is low in fertility, the tilth and workability are good in the 6-inch surface layer. Fair to good pastures of grasses and legumes can be produced under good management, especially if the soil is drained and fertilized.

The acreage is used as follows: 17 percent for cultivated crops; 50 percent for hardwoods; 11 percent for idle land; and 22 percent for pasture. Capability unit IVw–1.

Morphology and Genesis of Soils

Soil is produced by the forces of weathering and soil development that act on the parent soil material. The characteristics of the soil at any given point depend on (1) the climate under which the soil material has weathered, (2) the plant and animal life on and in the soil, (3) the relief or lay of the land, (4) the physical and mineralogical composition of the parent material, and (5) the length of time the forces of development have acted on the material.

Climate and vegetation are the active factors of soil genesis. They act on the parent material accumulated through the weathering of rocks and change it into a natural body with horizons that have definite genetic relationships. The effects of climate and vegetation on the parent material are conditioned by relief, as it affects drainage, infiltration, erosion, and vegetation. The parent material also affects the kind of profile that can be formed. Time is involved in the changes that take place, so age is a factor in soil formation. A long time generally is needed for the development of distinct horizons.

The factors of soil formation are complex in their effects on the soil. The influence of any one factor is hard to isolate with certainty, since conditions of the other four must be specified. The five soil-forming factors are so interdependent that many of the processes in soil development are unknown. In Chambers County, however, climate and vegetation are not important in comparison of the soil series, since these two factors have been constant for all soils.

The age of a soil may be indicated by the horizons in the profile. A mature profile has well-defined horizons, or layers. A young or immature soil has no genetic horizonation and no definite accumulation of clay that has been leached from the upper horizon by percolating water.

The youngest soils are the soils of the bottom lands, which are still accumulating deposits of soil from water. These are the Congaree, Buncombe, and Chewacla soils that have formed from alluvium and are subject to stream overflow. Also in this group are the Starr, Seneca, and Worsham soils that have formed from local alluvium and colluvium in depressions and at the heads of draws and are not subject to overflow. All have very weak profile development.

A few older soils in Chambers County are intermediate in development. The horizons are not well defined, although evident, and there may be fewer layers than in mature soils. Soils in this group are of the Louisburg, Louisa, and Talladega series.

The mature soils have strong profiles. They are the upland soils in the county, except the three soil series previously named as of intermediate development, and the soils of the stream terraces (Altavista, Hiwassee, and Wickham). The mature soils have strong profiles and show the influence of all of the five factors in soil formation. They have a leached surface layer over a finer, heavier textured subsoil. The subsoil is uniform in color within each series and is well oxidized.

Classification of Soils

Soils may be classified in several ways to bring out their relationship to each other. In the higher categories, there are three groupings, or orders, called zonal, azonal, and intrazonal. In Chambers County, the zonal order is represented by the soils of the Reddish-Brown Lateritic and the Red-Yellow Podzolic great soil groups. The latter is subdivided further into red members, yellow members, and intergrades toward Planosols. The azonal order is represented by the Lithosols and the Alluvial soils. Chambers County has no intrazonal soils, but it does have six miscellaneous land types that are not commonly identified with great soil groups.

TABLE 20.—*Soil series of Chambers County, Ala., classified by soil orders and great soil groups, and factors that have contributed to differences in their morphology*

Great soil group and series	Parent material	Relief	Age as indicated by profile development	Soil drainage class
ZONAL				
Reddish-Brown Lateritic:				
Davidson	Hornblende and diorite	Gently to strongly sloping	Mature	Well drained.
Hiwassee	Old alluvium from the Piedmont upland.	Gently to strongly sloping	Mature	Well drained.
Lloyd	Mixed acidic and basic rock	Gently sloping to steep	Mature	Well drained.
Red-Yellow Podzolic:				
Red members:				
Cecil	Granite and gneiss	Gently sloping to moderately steep.	Mature	Well drained.
Madison	Mica and quartz mica schist and graphitic schist.	Gently sloping to steep	Mature	Well drained.
Mecklenburg	Diorite, gabbro, hornblende schist	Gently sloping to sloping	Mature	Moderately well drained.
Wickham	Old alluvium from the Piedmont upland.	Gently to strongly sloping	Mature	Well drained.
Yellow members:				
Altavista	Old alluvium from the Piedmont upland.	Nearly level to sloping	Mature	Moderately well drained.
Appling	Granite and gneiss	Gently sloping to moderately steep.	Mature	Well drained.
Colfax	Granite and gneiss	Nearly level to sloping	Mature	Imperfectly drained.
Intergrades toward Planosols:				
Durham (with weak fragipan)	Granite and gneiss	Gently sloping to sloping	Mature	Well to moderately well drained.
Helena (with weak fragipan)	Mixed acidic and some basic rock	Gently sloping to sloping	Almost mature	Moderately well drained.
Iredell (with weak claypan)	Hornblende gneiss and chloritic schist	Gently sloping to sloping	Almost mature	Imperfectly drained.
AZONAL				
Lithosols:				
Louisa	Mica schist and quartz mica schist	Strongly sloping to steep	Intermediate	Well drained.
Louisburg	Granite and gneiss	Sloping to steep	Intermediate	Well drained.
Talladega	Sericitic and graphitic schist and quartzite.	Sloping to steep	Intermediate	Well drained.
Alluvial soils:				
Buncombe	Alluvium from the Piedmont upland	Level to nearly level	Immature, young	Well to excessively drained.
Chewacla	Alluvium from the Piedmont upland	Nearly level	Immature, young	Moderately well drained.
Congaree	Alluvium from the Piedmont upland	Nearly level	Immature, young	Well drained.
Seneca	Local alluvium from light-colored Piedmont soils.	Nearly level to gently sloping	Immature, young	Well drained.
Starr	Local alluvium from dark-colored Piedmont soils.	Nearly level to gently sloping	Immature, young	Well drained.
Worsham	Local alluvium and colluvium from light-colored Piedmont soils.	Nearly level to gently sloping	Immature, young	Poorly drained.

To show their relationships, the various soil series are classified in table 20 by soil orders and great soil groups. The parent material, relief, age, and drainage class are given for each series. This classification is based mainly on characteristics noted in the field, and further study may change some of the classifications.

In the text that follows, the soil orders, the great soil groups within those orders, and a typical profile from the soil series within each great soil group are described. In the profile descriptions, the color is given both by name and by the Munsell color notation. All of the information given concerning color, texture, structure, and consistence applies to the moist soil. The acidity or alkalinity (pH) was obtained under conditions prevailing in the field.

Zonal soils

Zonal soils have well-developed characteristics that reflect the influence of the active factors of soil genesis—climate and living organisms, chiefly vegetation. The texture profile of the normal, or zonal, soil in this county generally shows a leached A horizon, or surface soil. This is underlain by a finer, heavier textured B horizon that is uniform in color and well oxidized. Beneath this layer is the C horizon. The C horizon varies in texture but generally it is coarser than the B horizon and finer than the A horizon. On the soils that had a thicker A horizon in their virgin state, erosion has removed part or all of the original sandy surface layer. The yellow or red clay has been exposed, and the original profile has been altered.

REDDISH-BROWN LATERITIC SOILS

The members of the Reddish-Brown Lateritic great soil group are zonal soils having a dark reddish-brown granular surface soil over a B horizon of red friable clay. The parent material is marked with a network of coarse multicolored streaks.

The soils in this county that are classed in this group differ from the true Reddish-Brown Lateritic soils to some extent. They have a dark reddish-brown surface layer fairly typical for this group, but the content of iron and aluminum oxides is not typical. In fact the content of these oxides is not notably higher than in red members of the Red-Yellow Podzolic soils. The material at depths of 3 to 4 feet is partly weathered brown and dark-brown hornblende gneiss, which is very light in weight. These soils do not have the multicolored streaks and mottles generally found in this great soil group. The Reddish-Brown Lateritic soils in Chambers County are in the Davidson, Hiwassee, and Lloyd series.

Davidson series.—The soils of the Davidson series formed from hornblende and similar basic rocks. They are not so sandy as the Lloyd soils of the Reddish-Brown Lateritic group. They are well drained and gently sloping to strongly sloping. There is little difference in color among the horizons in the profile.

Profile of Davidson loam:

- A_{11} 0 to 2 inches, dark-red (10R 3/6) loam of crumb structure; very friable and high in organic matter; clear smooth boundary; pH 5.5 to 5.0.
- A_{12} 2 to 9 inches, dark-red (10R 3/6) very friable loam of crumb structure; clear smooth boundary; pH 5.5 to 5.0.
- B_1 9 to 18 inches, dark-red (10R 3/6) friable clay loam; weak medium subangular blocky structure; diffuse irregular boundary; pH 5.0 to 4.5.
- B_2 18 to 42 inches, dark-red (10R 3/6) friable to firm clay; weak to moderate medium subangular blocky structure; diffuse irregular boundary; pH 5.0 to 4.5.
- C 42 inches +, basic rocks and dark-red friable to firm clay in the spaces between the rocks.

Hiwassee series.—The soils of the Hiwassee series were derived from old alluvium washed from the Piedmont upland. They occur on the high river terraces on well-drained, gentle to strong slopes. The depth of the profile ranges from 24 to 60 inches. In places the subsoil contains mica.

A profile of Hiwassee fine sandy loam from a pasture:

- A_p 0 to 6 inches, dark-brown (7.5YR 3/2) very friable fine sandy loam of crumb structure; clear smooth boundary; pH 5.0 to 4.5.
- B_1 6 to 12 inches, red (2.5YR 4/8) friable sandy clay loam; weak medium subangular blocky structure; clear smooth boundary; pH 5.0 to 4.5.
- B_2 12 to 24 inches, dark-red (2.5YR 3/6) friable to firm clay; weak to moderate medium subangular blocky structure; gradual irregular boundary; pH 5.0 to 4.5.
- B_3 24 to 30 inches, dark-red (10R 3/6) friable clay; weak medium subangular blocky structure; gradual irregular boundary; pH 5.0 to 4.0.
- D_{gr} 30 inches +, unconsolidated and weakly cemented gravel beds.

Lloyd series.—The soils of the Lloyd series have developed from a mixture of acidic rocks, such as granite and gneiss, and basic rocks, such as hornblende and diorite. They occur throughout the county on gentle to steep slopes. There is little color difference among the horizons.

A profile of Lloyd sandy loam is as follows:

- A_{11} 0 to 6 inches, dark reddish-brown (2.5YR 3/4) friable sandy loam, high in organic matter; crumb structure; clear smooth boundary; pH 5.5 to 5.0.
- A_{12} 6 to 12 inches, dark reddish-brown (2.5YR 3/4) friable sandy loam; crumb structure; clear smooth boundary; pH 5.5 to 5.0.
- B_1 12 to 17 inches, dark-red (2.5YR 3/6) friable sandy clay loam; weak medium subangular blocky structure; gradual wavy boundary; pH 5.0 to 4.5.
- B_2 17 to 35 inches, dark-red (10R 3/6) friable to firm sandy clay to clay; moderate medium subangular blocky structure; gradual wavy boundary; pH 5.0 to 4.5.
- C 35 inches +, basic rocks and dark-red (10R 3/6) friable sandy clay in spaces around the rocks.

RED-YELLOW PODZOLIC SOILS

In the Red-Yellow Podzolic great soil group are well-developed, well-drained, acid soils of the zonal order. They have thin organic (A_0) and organic-mineral (A_1) horizons over a light-colored, bleached (A_2) horizon, which is underlain by a red, yellowish-red, or yellow more clayey (B) horizon in which materials leached from overlying layers have accumulated (*4*). They have developed under a deciduous or mixed forest in a warm-temperate, moist climate.

The Red-Yellow Podzolic great soil group consists of red members and yellow members that are distinguished by the color of the B horizon. In Chambers County, the red members belong to four soil series and the yellow members to three.

The cause of the pronounced color difference between the red and yellow members is not entirely known. The yellow soils apparently are from parent materials

lower in bases than the parent materials of the red soils. The parent materials of the yellow members are coarser textured than those of the red members.

Red Members

The red members of the Red-Yellow Podzolic great soil group are soils of the Cecil, Madison, Mecklenburg, and Wickham series. These soils apparently developed under similar climate and vegetation. All are well drained except the Mecklenburg soils, which are moderately well drained. All are mature enough to have well-developed profiles. Their slopes range from gently sloping to steep, but differences among their profiles do not result from differences in slope. Most of the differences among the various profiles can be correlated with marked differences in the parent materials.

Cecil series.—The soils of the Cecil series have developed from residual materials weathered from granite and gneiss. They are well-drained, gently sloping to moderately steep, deep to shallow soils. They have a dark-brown to red surface soil and a dark-red, permeable, sandy clay subsoil. The Cecil soils are red members of the Red-Yellow Podzolic great soil group.

Profile of Cecil gravelly sandy loam:

- A_1 0 to 6 inches, brown to dark-brown (10YR 4/3) very friable gravelly sandy loam of crumb structure; high in organic matter; clear smooth boundary; pH 5.0.
- A_2 6 to 11 inches, yellowish-red (5YR 4/8) very friable sandy loam of crumb structure; clear smooth boundary; pH 5.0 to 4.5.
- B_1 11 to 15 inches, red (2.5YR 5/6) friable sandy clay loam; weak medium subangular blocky structure; clear smooth boundary; pH 5.0 to 4.0.
- B_2 15 to 30 inches, dark-red (2.5YR 3/6) friable to firm sandy clay; weak to moderate medium subangular blocky structure; gradual wavy boundary; pH 5.0 to 4.0.
- B_3 30 to 36 inches, red (2.5YR 4/8) friable fine sandy clay; weak medium subangular blocky structure; diffuse wavy boundary; pH 4.5 to 4.0.
- C 36 inches +, red (2.5YR 5/6) friable sandy clay; massive (structureless); yellow, reddish-yellow, and yellowish-brown mottles are common, medium, and distinct; gradual transition at 40 to 50 inches to partly weathered granite and gneiss; pH 4.5 to 4.0.

Madison series.—The soils of the Madison series have developed from mica schist, quartz mica schist, and graphitic schist. The soils are highly micaceous, especially in the subsoil. They are well-drained, moderately deep to deep soils with a reddish-brown to brown surface soil and a dark-red subsoil. They have less sand through the profile than the Cecil soils. Both are red members of the Red-Yellow Podzolic group.

Profile of a Madison gravelly fine sandy loam:

- A_{11} 0 to 4 inches, dark-brown (7.5YR 4/4) very friable gravelly fine sandy loam with a high organic-matter content; crumb structure; clear smooth boundary; pH 5.0 to 4.5.
- A_{12} 4 to 8 inches, brown (7.5YR 5/4) very friable gravelly fine sandy loam; crumb structure; clear smooth boundary; pH 5.0 to 4.0.
- B_1 8 to 13 inches, red (2.5YR 4/6) friable micaceous sandy clay loam; weak fine subangular blocky structure; gradual wavy boundary; pH 4.5 to 4.0.
- B_2 13 to 32 inches, dark-red (2.5YR 3/6) friable to firm clay; highly micaceous; moderate medium subangular blocky structure; diffuse irregular boundary; pH 4.5 to 4.0.
- B_3 32 to 40 inches, dark-red (2.5YR 3/6) very friable clay loam; contains more mica than horizon above; weak medium subangular blocky structure; diffuse irregular boundary; pH 4.5 to 4.0.
- C 40 inches +, partly weathered mica schist and highly micaceous dark-red (2.5YR 3/6) friable clay.

Mecklenburg series.—The soils of the Mecklenburg series have developed in materials weathered from hornblende schists, diorite, and gabbro. They are moderately well drained, moderately deep to deep soils on gently sloping to sloping relief. These soils are not so mature as the other red members of the Red-Yellow Podzolic group.

Profile of a Mecklenburg clay loam in an idle field:

- B_{1p} 0 to 6 inches, reddish-brown (5YR 4/4) firm clay loam; weak to moderate medium subangular blocky structure; clear smooth boundary; pH 5.0 to 4.5.
- B_2 6 to 21 inches, red (2.5YR 4/8) clay; firm when moist and slightly plastic when wet; moderate medium subangular blocky structure; clear smooth boundary; pH 4.5 to 4.0.
- B_3 21 to 30 inches, yellowish-red (5YR 4/8) firm clay that is slightly plastic; a few, fine, faint mottles of yellow; moderate medium subangular blocky structure; clear smooth boundary; pH 4.5 to 4.0.
- C 30 to 40 inches, yellowish-red (5YR 5/8) firm clay; massive (structureless); common, fine, faint mottles of yellow.

Wickham series.—These soils have developed on old alluvium washed from the Piedmont upland. They are well-drained, moderately deep to deep, gently sloping to strongly sloping soils on the high stream terraces. Mica occurs in the subsoil in some areas. These soils are red members of the Red-Yellow Podzolic great soil group.

Profile of Wickham fine sandy loam from a pasture:

- A_{1p} 0 to 5 inches, brown (7.5YR 5/4) friable fine sandy loam; crumb structure; clear smooth boundary; pH 5.0 to 4.5.
- A_{12} 5 to 11 inches, reddish-brown (5YR 4/3) friable sandy loam; crumb structure; clear smooth boundary; pH 5.0 to 4.5.
- B_1 11 to 19 inches, red (2.5YR 4/8) friable sandy clay loam; weak medium subangular blocky structure; clear smooth boundary; pH 4.5 to 4.0.
- B_2 19 to 35 inches, red (2.5YR 4/8) friable to firm sandy clay loam to clay; weak to moderate medium subangular blocky structure; gradual irregular boundary; pH 4.5 to 4.0.
- D_{gr} 35 inches +, unconsolidated or weakly cemented gravel beds.

Yellow Members

The yellow members of the Red-Yellow Podzolic great soil group are soils of the Altavista, Appling, and Colfax series. The Appling soil is an intergrade between the red and yellow members, but it is on the yellow side. The Altavista and Colfax soils are not so well drained as the red soils.

Altavista series.—The well-drained Altavista soils have developed in old alluvium washed mainly from the Piedmont upland. They occur on low stream terraces on nearly level to sloping relief. Much mica occurs in the subsoil in some places. This series is a yellow member of the Red-Yellow Podzolic group and has more sand in the profile than the red members.

Following is a description of a profile of Altavista fine sandy loam in a pasture:

A_p 0 to 7 inches, light yellowish-brown (2.5Y 6/4) crumb-structured fine sandy loam, very friable; clear smooth boundary; pH 5.0 to 4.5.

B_1 7 to 14 inches, brownish-yellow (10YR 6/6) friable sandy clay loam; weak medium subangular blocky structure; clear smooth boundary; pH 5.0 to 4.5.

B_2 14 to 26 inches, yellowish-brown (10YR 5/8) friable sandy clay loam; weak medium subangular blocky structure; gradual wavy boundary; pH 5.0 to 4.0.

B_3 26 to 36 inches, light olive-brown (2.5Y 5/6) friable to firm sandy clay; shows many medium and distinct mottles of yellowish brown to strong brown; weak to moderate medium subangular blocky structure; gradual wavy boundary; pH 5.0 to 4.0.

C 36 to 48 inches, massive (structureless) friable to firm sandy clay mottled with yellowish brown (10YR 5/8), olive yellow (2.5Y 6/6), red (2.5YR 5/8), strong brown (7.5YR 5/8), and gray (2.5Y 5/0); abrupt irregular boundary; pH 4.5.

D_{gr} 48 inches +, unconsolidated to weakly cemented gravel beds.

Appling series.—The well-drained Appling soils have developed from granite and gneiss on gently sloping to moderately steep Piedmont upland. Although this series is classed as a yellow member of the Red-Yellow Podzolic group, it is closely associated geographically with one of the red members, the Cecil soils. The Appling soils are lighter textured throughout the profile than the Cecil. This indicates that their parent material contained more silica and less bases than the Cecil soils. Appling soils also have more quartz gravel on the surface and in the profile.

Profile of Appling sandy loam:

A_1 0 to 6 inches, light brownish-gray (10YR 6/2) very friable sandy loam that has some organic matter; crumb structure; clear smooth boundary; pH 5.0 to 4.5.

A_2 6 to 10 inches, light yellowish-brown (10YR 6/4) very friable sandy loam; crumb structure; clear smooth boundary; pH 5.0 to 4.5.

B_1 10 to 17 inches, yellowish-red (5YR 5/8) friable sandy clay loam; weak medium subangular blocky structure; clear smooth boundary; pH 4.5 to 4.0.

B_2 17 to 29 inches, yellowish-red (5YR 4/8) friable sandy clay containing few, fine, faint yellow mottles; weak medium subangular blocky structure; gradual wavy boundary; pH 4.5 to 4.0.

B_3 29 to 45 inches, yellowish-red (5YR 4/8) friable sandy clay containing many, coarse, prominent red and yellowish-brown mottles; moderate medium subangular blocky structure; abrupt wavy boundary; pH 4.5 to 4.0.

C 45 inches +, yellowish-red (5YR 4/8) to red (2.5YR 4/8) firm sandy clay; massive (structureless); red, yellow, and yellowish-brown mottles are common, medium, and distinct.

Colfax series.—The soils of the Colfax series were derived from granite and gneiss. They are imperfectly drained, moderately deep to deep soils that occur on nearly level to sloping relief around the heads of minor streams and on divides between draws. They also occur at the bases of sloping to strongly sloping areas. Seepage water from the nearby uplands causes imperfect drainage and reduces oxidation.

Profile of Colfax sandy loam in a cultivated area:

A_p 0 to 6 inches, olive (5Y 5/3) very friable coarse sandy loam; crumb structure; clear smooth boundary; pH 4.5 to 4.0.

A_2 6 to 13 inches, pale-olive very friable coarse sandy loam; crumb structure; gradual irregular boundary; pH 4.5 to 4.0.

B_2 13 to 29 inches, pale-yellow (5Y 7/3) coarse sandy clay loam; many, fine, distinct red, yellow, and brown mottles; slightly sticky when wet and friable when moist; weak medium subangular blocky structure; gradual irregular boundary; pH 4.5 to 4.0.

C 29 to 50 inches, coarse, light-gray (5Y 7/1), yellow (2.5Y 7/6), and brown (10YR 5/3) sandy clay; massive (structureless); sticky when wet and friable when moist; pH 4.0.

D_r 50 inches +, partly weathered rock.

Intergrades Toward Planosols

There are no true Planosols in Chambers County, but soils of three series in the Red-Yellow Podzolic group resemble Planosols and are classed as intergrades toward Planosols.

Planosols are soils that have a leached surface horizon. This surface layer is underlain by a B horizon that is more strongly illuviated, cemented, or compacted than those of associated normal soils. These soils were developed on nearly level to gently sloping upland, under grass or forest vegetation, in a humid or subhumid climate (*6*).

The three series in the county showing planosolic characteristics are the Durham, Helena, and Iredell. The Durham soils have a weak fragipan, or compacted layer, underlying the upper part of the subsoil, or B_2 horizon. The Helena soil has the same kind of layer, though it is not so strongly expressed. The Iredell soil has a dense, heavy clay subsoil through which water does not percolate easily. This subsoil is hydromorphic and holds water. A sample from this subsoil dries slowly and, when dried, it moistens with equal difficulty. It seems to be inherently compact.

Several factors contributed to the formation of the compact layer. During the development of these soils, climate was similar to that for other Red-Yellow Podzolic soils, but the lower parts of these planosolic soils were moister and less well aerated. Most of the water that accumulated on the surface passed down through the profile. Also, the normal, or geologic, erosion was slow because the land was nearly level. In some places, as in Iredell soils, permeability of the parent material is very slow.

Durham series.—The Durham series consists of well to moderately well drained soils that have developed from granite and gneiss, on gently sloping to sloping relief. The weak fragipan below the B_2 horizon causes impaired internal drainage, although permeability down to this fragipan is moderate. This fragipan is the main difference between the Durham soils and other members of the Red-Yellow Podzolic group. The Durham soils are in the Cecil-Appling catena and are of similar morphology. The other soils in this catena were derived more from granite, however, and less from gneiss.

Profile of Durham sandy loam in a cultivated area:

A_{1p} 0 to 6 inches, dark grayish-brown (2.5Y 4/2) very friable sandy loam; crumb structure; clear smooth boundary; pH 4.5 to 4.0.

A_2 6 to 16 inches, olive (5Y 5/3) friable sandy loam; crumb structure; clear smooth boundary; pH 4.5 to 4.0.

B_2 16 to 32 inches, yellowish-brown (10YR 5/8) friable sandy clay; weak fine subangular blocky structure; gradual wavy boundary; pH 4.5 to 4.0.

B_{3m} 32 to 40 inches, fragipan of yellowish-brown (10YR 5/8) friable sandy clay to sandy clay loam showing shotlike concretions and brown, common, fine, distinct mottles; weak fine subangular blocky structure; pH 4.5 to 4.0; gradual transition to layer below.

C 40 inches +, yellow, light-gray, and light-red granite and gneiss, friable, disintegrated, and partly weathered.

Helena series.—The Helena series consists of moderately well drained, gently sloping to sloping soils derived from granite and gneiss. The Helena soils have a weak fragipan that impairs internal drainage and evidently reduces oxidation.

Profile of Helena sandy loam in a cultivated area:

A_p 0 to 6 inches, light-gray (10YR 7/2) very friable sandy loam; crumb structure; clear smooth boundary; pH 4.5 to 4.0.

B_1 6 to 11 inches, strong-brown (7.5YR 5/8) friable sandy clay; weak medium subangular blocky structure; gradual wavy boundary; pH 4.5 to 4.0.

B_2 11 to 22 inches, yellowish-brown (10YR 5/8) firm sandy clay; common, medium, distinct red and yellow mottles; moderate medium subangular blocky structure; gradual wavy boundary; pH 4.5 to 4.0.

B_3 22 to 27 inches, yellowish-brown (10YR 5/8) friable sandy clay; common, medium, prominent brownish-yellow and yellowish-red mottles; weak medium subangular blocky structure; gradual wavy boundary; pH 4.5 to 4.0.

C 27 inches +, yellowish-brown (10YR 5/8) firm sandy clay; massive (structureless); common, coarse, prominent red mottles.

Iredell series.—The Iredell series consists of heavy, compact upland soils derived from hornblende gneiss and greenish chloritic schist. The soils are shallow to moderately deep, imperfectly drained, and gently sloping to sloping. They have the compact horizon showing planosolic characteristics. This horizon is a tough, heavy, impervious clay subsoil similar to a claypan, although not a true claypan. Water permeates slowly through this pan. The Iredell soils are much heavier and more compact than other Red-Yellow Podzolic soils.

Profile of an Iredell soil:

A_1 0 to 6 inches, olive (5Y 4/3) friable sandy loam showing many shotlike concretions; crumb structure; clear smooth boundary; pH 5.0 to 4.5.

A_2 6 to 12 inches, light olive-brown (2.5Y 5/4) friable gravelly sandy loam showing more concretions than layer above; crumb structure; clear smooth boundary; pH 5.0 to 4.5.

B_2 12 to 22 inches, light olive-brown (2.5Y 5/6) clay showing many, medium, distinct red mottles; very firm when moist and plastic when wet; strong medium angular blocky structure; gradual wavy boundary; pH 5.0 to 4.0.

C_1 22 to 29 inches, olive-gray (5Y 5/2) clay; very firm and massive (structureless); shows many yellow, fine, distinct mottles; breaks abruptly to layer below.

D_r 29 inches +, slightly weathered fine-grained hornblende gneiss.

Azonal soils

Azonal soils do not have well-developed profiles. They have not been in place long enough for the processes of soil formation to alter the soil materials. The azonal soils of this county are in the Lithosol and Alluvial great soil groups.

LITHOSOLS

The Lithosols are an azonal group of soils that show little or no soil development. They consist mainly of partly weathered masses of rock fragments or of nearly barren rock (*7*).

In this county, the soils classed as Lithosols are members of the Louisa, Louisburg, and Talladega series. These three differ mainly in the kind of parent material. There is also some variation in the degree of profile development. Of the three, the Louisa soils are in the most advanced stage of development.

The soils of these three series show some development of a subsoil, but not enough to allow classifying them as Red-Yellow Podzolic soils. They apparently are like the Red-Yellow Podzolic soils in parent material, resistance of the parent material to weathering, and age. They are on strong slopes, however, and geologic erosion probably has removed the soil material as it formed.

Louisa series.—The soil of this series is on well-drained, strongly sloping to steep uplands. It developed from mica schist and quartz mica schist. The depth to the weathered schist ranges from 6 to 15 inches. In most areas, a B horizon of yellowish-red sandy clay loam, 3 to 10 inches thick, has developed. Stones are on the surface in many places.

Profile of Louisa stony sandy loam:

A 0 to 4 inches, brown (10YR 5/3) very friable sandy loam; crumb structure; clear smooth boundary; pH 5.0 to 4.5.

B 4 to 10 inches, yellowish-red (5YR 5/8) very friable sandy clay loam; highly micaceous; weak medium subangular blocky structure; abrupt irregular boundary; pH 5.0 to 4.5.

D_r 10 inches +, partly weathered quartz mica schist.

Louisburg series.—The Louisburg series consists of well-drained, sloping to steep soils developed from granite and gneiss on the uplands. The depth to bedrock ranges from 4 to 12 inches. These soils may have a thin, yellowish sandy clay B horizon in places. Most areas are stony.

Profile of Louisburg stony sandy loam:

A 0 to 6 inches, light-gray (2.5Y 7/2) to light brownish-gray (2.5Y 6/2) very friable sandy loam; crumb structure; clear smooth boundary; pH 5.0 to 4.5.

B 6 to 9 inches, yellowish-brown (10YR 5/4) friable sandy clay; very weak medium subangular blocky structure; pH 4.5 to 4.0; abrupt break to layer below.

D_r 9 inches +, partly weathered granite and gneiss.

Talladega series.—This series consists of well-drained, sloping to steep soils on the uplands. They have developed from sericitic schist that includes graphitic schist and quartzite in some places. The depth to this parent material ranges from 6 to 16 inches. A friable red B horizon, 2 to 6 inches thick, has developed in places. Nearly all of these soils are gravelly, and some are stony.

Profile of Talladega gravelly loam in a forested area:

A_1 0 to 6 inches, brown to dark-brown (10YR 4/3) very friable gravelly loam to sandy loam; high in organic-matter content; crumb structure; clear smooth boundary; pH 5.0 to 4.5.

A_2 6 to 10 inches, strong-brown (7.5YR 5/6) very friable sandy loam; crumb structure; abrupt irregular boundary; pH 5.0 to 4.5.

D_r 10 inches +, partly weathered rock.

ALLUVIAL SOILS

Alluvial soils are an azonal group of soils developed from transported material more recently deposited than that of other great soil groups. The Alluvial soils are characterized by a weak modification (or none) of the original material by soil-forming processes.

In Chambers County, six series are classified as Alluvial soils. They occur on nearly level to gently sloping relief on first bottoms and in depressions near draws. Since Alluvial soils are still in the formative stage, they have little or no horizonation. They are young, immature, and lack a soil profile with genetically related horizons.

Alluvial soils that are on similar parent material may differ in drainage. Varying characteristics may exist because of these drainage differences. The Alluvial soils are classed as well to excessively drained, well drained, moderately well drained, and poorly drained.

The soils in the Alluvial group are the Buncombe, Chewacla, Congaree, Seneca, Starr, and Worsham. The first three are forming from general alluvium of mixed origin along major stream courses. The latter three are forming from local alluvium at the bases of slopes and along small streams. The Buncombe and Congaree soils show some profile development. They have a B horizon that shows either a weak texture or color. The Worsham soils, though classed as Alluvial soils, are of intermediate age.

Buncombe series.—The Buncombe series consists of deep, light-textured, well drained to excessively drained soils that are forming from general alluvium. These soils occur on level to nearly level flood plains adjacent to the larger streams and rivers. They are similar to the Congaree soils but are sandier and lighter textured.

Profile of Buncombe loamy sand in a pasture:

0 to 10 inches, brown (10YR 4.5/3) very friable loamy sand; clear smooth boundary; pH 5.0 to 4.0.
10 to 46 inches, strong-brown (7.5YR 5/6) very friable loamy sand; clear smooth boundary; pH 4.5 to 4.0.
46 inches +, unconsolidated or weakly cemented gravel beds.

Chewacla series.—The soils of this series are forming from general alluvium recently washed from the Piedmont upland. These moderately well drained soils occur on nearly level relief along the larger streams throughout the county. They are younger and more immature than the Buncombe and Congaree soils and have no profile horizonation. Although there are distinct strata or layers laid down during floods, no B horizon has formed through leaching of clay particles or colloids downward from overlying layers. In places these soils may have a moderately high water table.

Profile of Chewacla loam in a cultivated field:

0 to 7 inches, yellowish-red (5YR 4/8) friable to very friable loam; crumb structure; clear smooth boundary; pH 5.0 to 4.5.
7 to 15 inches, yellowish-red (5YR 4/8) very friable to friable loam to sandy loam; crumb to weak medium subangular blocky structure; clear smooth boundary; pH 4.5 to 4.0.
15 to 26 inches, yellowish-red (5YR 4/8) to reddish-brown (5YR 4/4) friable loam; gray and yellow mottles are common, medium, and distinct; clear smooth boundary; pH 4.5 to 4.0.
26 to 30 inches +, yellowish-brown, dark reddish-brown, gray, and yellow loam, sandy loam, and sand; highly mottled; gradual transition to gray wet sands.

Congaree series.—This series consists of soils forming from general alluvium washed from soils of the Piedmont upland. They occur on nearly level relief along the Tallapoosa and Chattahoochee Rivers and, to some extent, along the larger creeks. Stream overflows leave new deposits of soil material. The texture of the surface soil ranges from sandy loam to loam.

Profile of Congaree loam taken in a pasture:

0 to 8 inches, brown (10YR 4/3) friable loam; crumb structure; clear smooth boundary; pH 5.0 to 4.5.
8 to 16 inches, yellowish-brown (10YR 5/6) friable loam; crumb structure; clear smooth boundary; pH 5.0 to 4.5.
16 to 32 inches, strong-brown (7.5YR 5/6) very friable fine sandy clay loam; weak medium subangular blocky structure; clear smooth boundary; pH 4.5 to 4.0.
32 to 60 inches, yellowish-brown (10YR 5/8) very friable sandy clay; very weak medium subangular blocky structure; clear wavy boundary; pH 4.5 to 4.0.
60 inches +, unconsolidated or weakly cemented gravel beds.

Seneca series.—This series consists of well-drained, moderately deep soils that are forming from local alluvium washed from the Piedmont upland. They are nearly level to gently sloping and are on foot slopes and in depressions at the heads of minor streams. These soils are immature, although some horizonation is evident. New soil material is deposited during heavy rains.

Profile of Seneca sandy loam in an idle area:

0 to 21 inches, light yellowish-brown (10YR 6/4) very friable sandy loam; clear smooth boundary; pH 5.0 to 4.5.
21 to 30 inches, yellowish-brown (10YR 5/8) friable sandy clay loam; crumb to weak medium subangular blocky structure; clear smooth boundary; pH 5.0 to 4.5.
30 to 40 inches +, yellow (2.5Y 7/8) friable sandy clay weathered from parent rock; weak medium subangular blocky structure; pH 4.5 to 4.0.

Starr series.—The soils of the Starr series are similar to the Seneca soils in position, drainage, and depth but are darker and heavier textured and have less horizonation. The Starr are immature soils forming from local alluvium washed down from dark-colored soils of the Piedmont upland, such as the Lloyd and Davidson. New deposits are added during heavy rains.

Profile of a Starr soil in a pasture:

0 to 24 inches, dark reddish-brown (5YR 3/3) friable loam; crumb structure; gradual irregular boundary; pH 5.0 to 4.5.
24 to 36 inches, dark reddish-brown (5YR 3/4) very friable sandy loam of crumb structure; thinly striated with sand and loamy sand; abrupt smooth boundary; pH 4.5 to 4.0.
36 to 46 inches +, olive-brown (2.5Y 4/4) very friable loamy sand.

Worsham series.—This series is forming from local alluvium and colluvium that washes from soils in the Piedmont upland, such as the Cecil and Appling, that developed from granite, gneiss, and schist. The Worsham soils appear to be of intermediate age, since they have some profile horizonation. They occur on nearly level to gently sloping relief around minor streams, in depressions, and at the foot of slopes. Drainage is poor, runoff is moderately slow, and permeability is slow.

Profile of Worsham sandy loam in a brushy area:

A_1 0 to 6 inches, light yellowish-brown (2.5YR 6/4) very friable sandy loam; clear smooth boundary; pH 5.0 to 4.5.

A_2 6 to 13 inches, olive-brown (2.5Y 4/4) friable sandy loam showing few, fine, faint yellow mottles; clear smooth boundary; pH 4.5 to 4.0.

B_1 13 to 18 inches, gray (2.5Y 5/0) friable sandy clay showing few, fine, faint yellow mottles; weak medium subangular blocky structure; clear smooth boundary; pH 4.5 to 4.0.

B_2 18 to 30 inches, gray (2.5Y 6/0) clay showing common, fine, faint yellow mottles; friable when moist and slightly plastic when wet; weak medium subangular blocky structure; clear smooth boundary; pH 4.5 to 4.0.

D 30 to 50 inches +, gray sandy clay showing distinct light-gray, strong-brown, and yellow mottles; massive (structureless); gradual transition to poorly weathered granite and gneiss at 50 to 65 inches.

Miscellaneous land types

Six miscellaneous land types, though not classified by great soil groups are mentioned in this section for convenience of the reader. These land types are Gullied land, Rock land, Rough broken land, Sandy alluvial land, poorly to somewhat poorly drained, Shallow land, and Stony land.

Gullied land occurs on almost all uplands. It is severely eroded and gullied, apparently from poor management. Rock land has bare outcrops of granite and gneiss, which cover about three-fourths of its surface. Rough broken land is steep, highly dissected land along streams. Sandy alluvial land, poorly to somewhat poorly drained, consists of undifferentiated first-bottom soils of the flood plains that are highly variable in color, texture, and consistence. Shallow land is made up of small acreages that have variable characteristics and are too shallow to classify in soil series. Stony land has stones on the surface and in the profile; it shows little soil development.

General Nature of the Area

This section is intended primarily for readers not familiar with Chambers County. It first tells about the physical geography of the county—the climate, geology, water supply, and vegetation. Then the history, population, and community and farm facilities are discussed. Finally, the agriculture of the county is summarized, mainly in terms of material selected from the United States Census of Agriculture.

Physical Geography

Climate.—Records on climate for the county are incomplete. For this reason, the records from Auburn in adjoining Lee County are used (table 21). Apparently, there is little difference in climate between the two counties.

The climate is humid, mild, and temperate. Summers are long and warm, but the nights are comfortable. Winters are short and mild. Although snow is not common, there is a trace of it in most winters.

The average frost-free season of 229 days extends from March 26 to November 10, which is ample time for maturing of local crops. Occasionally, the soil freezes to depths of 1 to 3 inches, but it thaws within 1 or 2 days. The land generally can be plowed in winter, although there may be periods of 2 to 3 weeks when it is too wet. Winter crops and vegetables make some growth during the winter and are rarely injured seriously by the cold.

As shown by the table, rainfall is fairly well distributed through the growing season and normally is sufficient for all crops. An occasional drought may last long enough to reduce crop yields. Severe windstorms sometimes occur in March and April.

Geology.—Chambers County is entirely within the Piedmont Plateau. The parent materials of the soils are from sedimentary and igneous rocks (*1*). There are three geological formations: Ashland mica schist in the northwestern corner; a narrow band of the Wedowee formation; and igneous schist and gneiss over most of the county.

The Ashland mica schist is composed of two types of sedimentary rocks—a garnetiferous biotite schist and a siliceous muscovite schist. In some degree the two types intergrade and mix; intrusions and invasions of acid and basic rocks occur. The main soils derived from the Ashland formation are the Madison and Louisa. The slope is steep from the streams and drainageways but gently sloping and sloping on the ridgetops.

TABLE 21.—*Temperature and precipitation at Auburn, Lee County, Alabama*

[Elevation, 730 feet]

Month	Temperature [1]			Precipitation [2]			
	Average	Absolute maximum	Absolute minimum	Average	Driest year (1954)	Wettest year (1948)	Average snowfall
	°F	°F	°F	*Inches*	*Inches*	*Inches*	*Inches*
December	49.1	84	9	5.60	3.80	3.79	[3]
January	48.2	81	4	4.60	.92	4.50	[3]
February	51.2	81	7	5.45	4.11	6.07	0.2
Winter	49.5	84	4	15.65	8.83	14.36	.2
March	56.4	89	13	5.85	2.93	12.07	.1
April	64.1	94	27	4.47	1.89	1.63	[3]
May	71.6	98	37	3.54	2.32	2.20	0
Spring	64.0	98	13	13.86	7.14	15.90	.1
June	77.0	107	46	4.06	1.52	5.81	0
July	79.9	108	57	5.32	4.54	11.62	0
August	79.4	106	53	4.85	1.85	5.68	0
Summer	78.8	108	46	14.23	7.91	23.11	0
September	76.1	97	42	3.10	.75	5.24	0
October	66.1	90	25	2.88	.92	1.37	0
November	55.5	84	9	3.11	2.89	17.77	[3]
Fall	65.9	97	9	9.09	4.56	24.38	[3]
Year	64.6	108	4	52.83	28.44	77.75	.3

[1] Average temperature based on a 64-year record, through 1955; highest temperature on a 57-year record and lowest temperature based on a 58-year record, through 1952.

[2] Average precipitation based on a 78-year record, through 1955; wettest and driest years based on a 74-year record, in the period 1855-1955; snowfall based on a 57-year record, through 1952.

[3] Trace.

The Wedowee formation consists of slate, phyllite, quartzite, and schist. Amorphous graphite occurs in places and causes the rock to be black or grayish black. Much of the Wedowee formation contains mica, garnet, staurolite, and cyanite. The formation was deposited as sediments, some of which were carbonaceous. The depth of this formation and of the Ashland mica schist is undetermined. The structure of these formations indicates repetition by complex folding and thrust faulting, which is difficult to judge in thickness. The major soils on the Wedowee formation are the Madison and the Talladega.

The igneous schist and gneiss, which cover most of the county, are of the Archean System. This system occurs in all the area south and east of High Pine Creek and is composed of hornblende gneiss, granite, and gneiss. The rocks have been identified as biotite gneiss, augen gneiss, granite, diorite, quartz diorite, epidiorite, and quartz diabase (*1*). There are areas of hornblendic rocks and gneissic hornblende granite. These rocks differ greatly in lithology and have a complex disordered structure caused by movements of the earth's crust in remote geological time. The result is a complex geologic pattern, in which it is difficult to separate strips and areas of basic rocks, granite gneisses, and micaceous gneisses and schists.

In the igneous schist and gneiss area, the Cecil, Appling, and related soil series are associated with the granite and granite gneiss. The Lloyd, Davidson, and related soil series are associated with the basic rocks. The Madison and Louisa series are associated with the biotite gneiss and gneissoid biotite granite.

Altitudes in the county, in feet, are as follows:

Buffalo	845	Standing Rock	763
Cusseta	753	Stroud	852
Lafayette	846	Waverly	750
Lanett	687		

Water supply.—The supply of water is abundant. The Tallapoosa and Chattahoochee Rivers and intermittent streams furnish water all year, even in the driest seasons, for use of cities, industries, and livestock. Hydroelectric plants are on the Chattahoochee and Tallapoosa Rivers, although those on the latter are outside the county. The 1954 Federal census showed 147 ponds built for agricultural use. Dug or drilled wells provide water most of the time for rural households.

Natural vegetation.—Originally, the county was heavily forested with mixed stands of pines and hardwoods, especially oak. Shortleaf predominated among the varieties of pine, but loblolly grew on the heavier soils. The hardwoods included post oak, blackjack oak, red oak, white oak, mockernut hickory, and redgum.

No large area of virgin forest remains. However, some of the original hardwoods, principally oak, are on rough and steep land that was never completely cut over. Small areas around plantations and homesites have never been completely cleared, but the trees valuable for timber have been cut.

Some land has been reforested, and the acreage in farm forest has increased since 1930. The 1954 Federal census showed the woodland acreage as 158,675, which consisted mostly of pines and some mixed hardwoods. The value of forest products sold from farms in 1954 was $168,122. This included 11,172 cords of pulpwood, 3,472 thousand board feet of saw logs, 56,655 fence posts, and 5,350 cords of firewood.

History and Development

The territory of Chambers County was part of the Creek Indian Nation before 1832 (*3*). The county was organized December 18, 1832, after the signing of the Cusseta Treaty with the Indians and their removal to reservations.

The early settlers came mostly from Georgia, the Carolinas, and Tennessee. At first, they produced corn, wheat, cattle, hogs, wool, and cotton for their own use. With slave labor, the acreage planted to cotton steadily increased, and it was the main crop by 1850. Only enough corn and livestock were produced for home use.

No soil conservation was practiced. Fertilizers were not used, crops were not rotated, and legumes were not grown. When the fertile topsoil eroded and production failed, the land was abandoned. New fields were cleared, more and more land was planted to the profitable cotton, and the people prospered. This rural prosperity reached its height about 1860. After the War Between the States, many of the large plantations were broken up and tenant farming replaced the slave system.

Population.—The population of the county increased steadily until 1920 but has remained rather stable since. During the 10 years from 1930 to 1940, there was an increase of 7.2 percent, but this was offset by a decrease of 6.2 percent from 1940 to 1950.

The 1950 Federal census lists the total population of the county as 39,528, of which 16,138 is classified as urban, and 23,390 as rural.

The largest town is Lanett in the southeastern part, which had a population of 7,434 in 1950. The southeastern corner, along the industrial Chattahoochee Valley, is the most populated area. Other towns there and their population are Shawmut, 3,266; Langdale, 2,721; Fairfax, 2,717; and Riverview, 1,322. Lafayette (population 2,353), in the central part of the county, is the county seat.

Smaller towns or railroad shipping points are Waverly, Cusseta, Buffalo, Five Points, and Stroud, all with populations between 75 and 300.

Transportation.—Four railroads and one branch line serve the county. The Western Railway of Alabama and the Chattahoochee Valley Railway are in the industrial southeastern corner. The southwestern area is served by the Central of Georgia, and a branch line of this system runs in a north-south direction through the center of the county. The Atlantic Coast Line is in the northeastern and northwestern parts. Bus and motortruck lines connect the principal cities outside the county.

As reported by the 1950 Federal census, 747 farms were located on hard-surfaced roads; 116 on gravel, shell, or shale roads; and 1,399 on dirt or unimproved roads. In 1954 there were 1,291 automobiles and 506 trucks on farms.

Farm-to-market roads reach practically all parts of the county. In 1950, the average distance over improved roads was 3.4 miles to the trading center visited most frequently. The average distance over dirt or unimproved roads was 1.6 miles. The average distance over all roads was 5 miles.

Community and farm facilities.—The county has a system of consolidated public schools and school bus service to all points. There are many churches and rural community clubs. Community facilities include rural mail routes accessible to all residents, a radio station at Lanett, and two newspapers. There are two hospitals at Lafayette and one at Langdale.

According to the 1954 census, 24 percent of the farm homes had telephones and 85.6 percent were served by electricity. Some farms have electric water pumps, home freezers, washing machines, chick brooders, feed grinders, and milking machines.

Industries.—Industry in the county provides outlets for some of the farm produce. Several thousand workers are employed in cotton mills at Fairfax, Lafayette, Langdale, Lanett, Riverview, and Shawmut. Lumbering is the second largest industry. Sawmills and planing mills are located throughout the county. A crate and box mill is in the northeastern corner at Standing Rock.

Agriculture

The early agriculture of the county was largely on a subsistence basis. Almost everything used in the home was produced on the farm. Corn, forage crops, and vegetables were grown for home use and for livestock—not for the market. The acreage of cotton, the main cash crop, increased up to 1910 but has decreased steadily since, because of the boll weevil, erosion of the soil, and economic conditions. Many farmers now work in cotton milling or lumber industries and farm only part of the time.

The 1954 farm acreage was 307,263 acres, of which 148,588 acres was cleared. The average farm was 141.1 acres. In 1954, owners operated 52.2 percent of all the farms; part-owners, 9.0 percent; tenants, 38.5 percent; and managers, 0.3 percent.

Cotton, livestock, and forest produce the principal farm income. The acreages of the principal crops and the number of bearing fruit and nut trees and grapevines for 1929, 1939, 1949, and 1954 are shown in table 22.

In 1954 there were 1,238 miscellaneous and unclassified farms in the county. The rest of the farms were classified as follows:

Type of farm:	*Number of farms*
Cotton	707
Dairy	68
Poultry	20
Other livestock	134
Primarily crop	6
Primarily livestock	7
Crop and livestock	29

TABLE 22.—*Acreage of the principal crops and number of fruit and nut trees and grapevines of bearing age*

Crop	1929	1939	1949	1954
	Acres	*Acres*	*Acres*	*Acres*
Cotton harvested	73,347	33,174	17,619	11,001
Corn for all purposes	42,952	56,372	23,429	17,427
Sorghum, for all purposes except sirup	234	756	778	993
Small grains (oats and wheat)	343	2,150	1,573	2,307
All hay	769	2,256	5,167	9,784
Alfalfa	7	66	471	177
Clover, timothy, and grass mixtures.	1	101	282	638
Lespedeza	(1)	355	2,095	2,801
Small grains	83	324	834	4,130
Other hay cut	678	1,410	1,485	2,038
Soybeans for all purposes	158	2,489	119	287
Cowpeas for all purposes	480	4,098	600	365
Peanuts for all purposes	532	1,718	245	100
Vegetables harvested for sale (other than Irish and sweet potatoes)	177	185	353	213
	Number [2]	*Number* [2]	*Number* [2]	*Number*
Apple trees	7,983	7,275	4,730	2,360
Peach trees	21,128	21,666	3,330	1,647
Pear trees	1,614	2,089	1,643	596
Pecan trees	4,582	6,587	6,662	4,319
Grapevines	2,582	861	405	372

[1] Not reported.

[2] One year later than year given at head of column.

The number of livestock on the farms in the county in 1954 was as follows:

Livestock:	*Number*
Horses and colts	534
Mules and mule colts	1,762
Cattle and calves	26,571
Hogs and pigs	5,142
Sheep and lambs	401
Chickens, 4 months old and over	52,108

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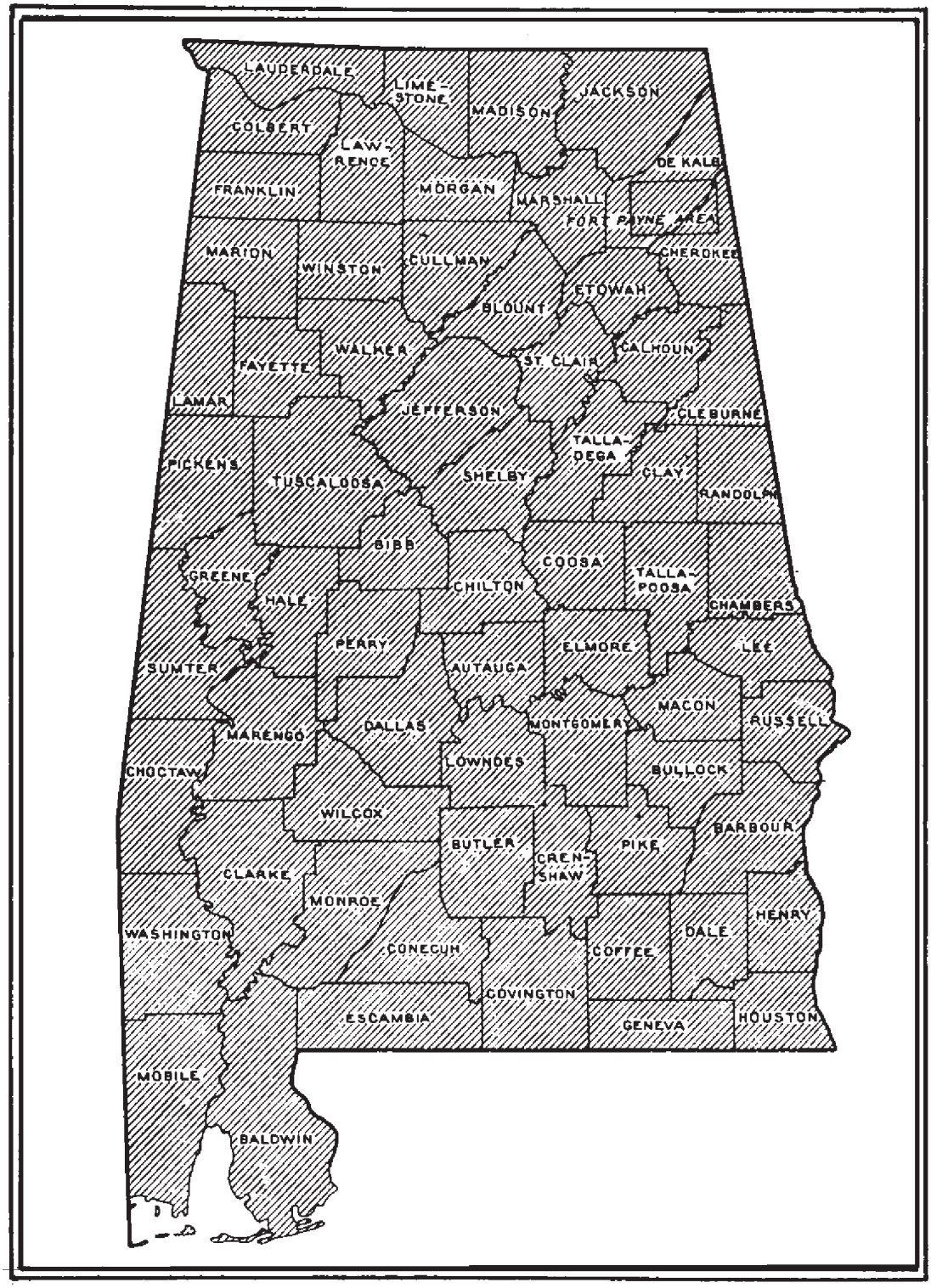

Areas surveyed in Alabama shown by shading.

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