Series 1956, No. 5 Issued December 1959

SOIL SURVEY

Coffee County Tennessee

OUR SOIL ★ OUR STRENGTH

UNITED STATES DEPARTMENT OF AGRICULTURE
Soil Conservation Service
In cooperation with
TENNESSEE AGRICULTURAL EXPERIMENT STATION
TENNESSEE VALLEY AUTHORITY

HOW TO USE THE SOIL SURVEY REPORT

THIS SURVEY of Coffee County will serve several groups of readers. It will help the 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; 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 the 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 the 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 map of the county on which numbered rectangles have been drawn 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, wherever it appears on the map. Suppose, for example, an area located on the map has the symbol Sd. The legend for the detailed map shows that this symbol identifies Sequatchie fine sandy loam, gently sloping phase. This soil and all the others mapped in the county are described in the section, Descriptions of Soils.

Finding information

Few readers will be interested in all of the report, for it has special sections for different groups. The section, General Character of the Area, which discusses climate, physiography, and other subjects, will be of interest mainly to those not familiar with the county.

Farmers and those who work with farmers will want to learn about the soils in the section, Descriptions of Soils, and then go to the sections, Use and Management of Soils and Estimated Yields. In this way they first identify the soils on their farms 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 section on soil descriptions, Sequatchie fine sandy loam, gently sloping phase, is shown to be in capability unit IIe-1. The management this soil needs therefore will be found under the heading Capability Unit IIe-1, in the section, Use and Management of Soils.

Engineers will want to refer to the section, Engineering Properties of Soils. A table in that section shows depth to bedrock, the texture of the soil layers, drainage, and other characteristics of the soils that affect engineering.

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

Students, teachers, and other users will find information about soils and their management in various parts of the report, depending on their particular interest.

Fieldwork for this survey was completed in 1956. Unless otherwise indicated, all statements in the report refer to conditions in the county at that time.

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Series 1955, No. 5 Issued December 1959

Soil Survey of Coffee County, Tennessee

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United States Department of Agriculture in Cooperation with Tennessee Agricultural Experiment Station and Tennessee Valley Authority

COFFEE COUNTY is in the south-central part of Tennessee; Manchester, the county seat, is approximately in the center of the county (fig. 1). The total land area of the county is 435 square miles, or 278,400 acres.

Since early settlement until very recently, agriculture has been the leading occupation. In recent years much of the population has been employed in shoe, garment, and sporting goods factories and in the United States Air Force Arnold Engineering Development Center, an aircraft research project. About 48 percent of the county has been cleared for crops and pasture. Most of the remaining 52 percent is in forest of poor quality. Practically all of the forest has been damaged by overcutting and by fires. Corn, wheat, cotton, potatoes, and soybeans are the chief crops. Beef cattle and hogs are the principal livestock. Dairying has increased in recent years. This soil survey was made to provide a basis for best agricultural uses of land.

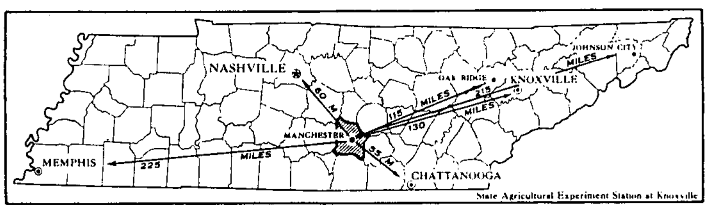

***Figure 1.*—Location of Coffee County in Tennessee.**

Soil Survey Methods and Definitions

The scientist who makes a soil survey examines the soils in the field, classifies the soils in accordance with facts that he observes, and maps their boundaries on an aerial photograph or 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. Usually they are not more than a quarter of a mile apart and sometimes they are much closer. In most soils each boring or hole reveals several distinct layers, called horizons, which collectively 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.

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 individual soil particles are arranged in larger aggregates and the amount of pore space between grains, gives us 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.

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 presence of gravel or stones in amounts that will interfere with cultivation; the steepness and pattern of slopes; the degree of erosion; the nature of the underlying parent material from which the soil has developed; and 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 by phases, types, and series. The soil type is the basic classification unit. A soil type may consist of several phases. Types that resemble each other in most of their characteristics are grouped into soil series.

As an example of soil classification, consider the Cumberland series of Coffee County. This series is made up of two soil types, subdivided into phases as follows:

Series	*Type*	*Phase*
Cumberland	Silt loam	Eroded gently sloping phase.
		Gently sloping phase.
		Eroded sloping phase.
	Silty clay loam	Severely eroded gently sloping phase.
		Severely eroded sloping phase.

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 divided into two or more phases. Slope variations, frequency of rock outcrop, degree of erosion, depth of the soil over the substratum, and 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 therefore can be specified more easily for soil phases than for soil series or yet broader groups that contain more variation.

Soil series.—Two or more soil types that differ in surface texture, but are otherwise similar in kind, thickness, and

[1] R. C. Jurney, Soil Survey, Soil Conservation Service, assisted in writing the report.

[2] In charge part of the time the survey was in progress.

arrangement of soil layers, are normally designated as a soil series. In a given area, however, a soil series frequently is represented by only one soil type. Each series is named for a place near which it was first mapped.

Miscellaneous land types.—Areas that have little true soil are not classified by types and series; they are identified by descriptive names, such as Rockland and Rock outcrop.

Undifferentiated soil groups.—Two or more similar soils that do not occur in regular geographic association that are mapped as one unit. Mimosa, Baxter, and Colbert very rocky soils, strongly sloping phases, is an undifferentiated soil group mapped in Coffee County.

Slope range.—The slope classification used to express the slope ranges of the soils of Coffee County are as follows:

Slope classes	*Percent*
Level	0 to 2
Gently sloping	2 to 5
Sloping	5 to 12
Strongly sloping	12 to 20
Moderately steep	20 to 30
Steep	30 or more

Soil correlation is the process of assigning uniform names to soils of various areas. This is part of a nationwide system of mapping and classifying soils. The purpose of soil correlation is to show similarities and differences among the soils of each surveyed area and soils of the rest of the United States. To do this the same combination of soil characteristics is given the same name, wherever found.

A more detailed discussion of the methods used in soil surveying can be found in the Soil Survey Manual (*11*).[3] More complete definition of some of the foregoing terms and definitions of other unfamiliar terms used in this report can be found in the glossary.

Soil Associations

Soils occur in characteristic positions and in characteristic geographic association with other soils. The Baxter soils, for example, occur on the cherty ridges of the uplands, and they are generally associated with the Mountview and Greendale soils. The Hamblen soils occur on the stream bottoms, and they are commonly associated with the Staser and Prader soils of the bottom lands and with the Sequatchie and Whitwell soils of the low terraces.

By delineating groups of soils that are geographically associated, it is possible to prepare a generalized map showing large areas dominated by each group of associated soils. On such a basis, the soils of Coffee County have been delineated as 10 soil associations that have fairly well defined geographic boundaries. The soil association map bound at the back of this report is a generalized map made from the detailed soil maps. It shows, in color, the geographic distribution of the 10 soil associations.

A soil association may consist of a few or many soils. These soils may be similar or very different. Each association has a somewhat uniform soil pattern, but the soils in an association may not be similar in their suitability for agricultural use. The soils of an association differ one from another; some differ widely, others only slightly. A soil association, therefore, is a group of soils occurring together in a characteristic pattern. It is a land area in which the kind, proportion, and distribution of the component soils can be defined.

The association in which a particular soil occurs frequently affects the use of the soil and the relative importance of this soil to the agriculture of the area. If a soil that is suitable for corn is associated with other soils suitable for corn, this soil may or may not be used for corn. It may be heavily cropped to corn, however, if the soils associated with it are not suited to corn. If the associated soils are only fairly suitable for corn, then it can be determined how often the soil is to be cropped to corn and what crops to use in the rotation.

Each soil association is discussed in the following pages. More detailed information about the soils of each association can be obtained in the section, The Soils of Coffee County.

Armour-Huntington-Lindside Association

The Armour-Huntington-Lindside association occupies only 3.4 percent of the county. It consists of three areas along the Duck River and the larger creeks in the western and northwestern parts of the county. This association consists almost entirely of phosphatic alluvial and colluvial soils. Its relief is chiefly gently sloping but ranges from level to sloping. A few small areas are strongly sloping. The Duck River, Noah Fork, Garrison Fork, and McBride Branch drain the association. These streams flow westward into Bedford County.

The most extensive soils of this association are the well-drained Armour and Huntington soils and the moderately well drained to somewhat poorly drained Lindside soils. Less extensive are the Etowah, Pace, and Lee soils. The Armour soils occur on old colluvial benches and stream terraces. The Huntington and Lindside soils occupy nearly all of the first bottoms and young local alluvial-colluvial areas (fig. 2). The Etowah soils and the cherty Pace soils occur in positions similar to those of the Armour soils. Lee silt loam occupies a small acreage of poorly drained first bottoms. Gravelly land, a very small part of this association, occurs along the large streams.

Figure 2.—**Huntington silt loam, phosphatic phase (left) and Lindside silt loam, phosphatic phase (right) on the bottom land along the Duck River.**

[3] Italicized numbers in parentheses refer to Literature Cited, p. 112.

The soils of this association are fertile and generally easy to work and to conserve. All of them are phosphatic, the phosphate content being mostly medium to high. The Pace cherty silt loams and Huntington cherty silt loam, local alluvium phosphatic phase, are the only soils that contain chert that interferes materially with tillage.

This association consists chiefly of soils of subclasses IIe, IIs, and IIw. The soils of subclass IIIe and class I make up a smaller but important part. A very small part consists of soils of subclasses IVe, IIIw, and VIIs. Nearly all of this association except the areas in subclass VIIs are used for crops or pasture.

This association has a few wooded tracts and a few very narrow strips of trees bordering streams. Nearly all the Gravelly alluvial land of inferior quality is in thickets or thin stands of mixed hardwoods. The trees are chiefly beech, water birch, black walnut, locust, hackberry, ash, willow, poplar, sycamore, hickory, and oak.

The rural population of this association is moderately high. Most of the farms are of the general type on which some livestock is raised. Very few farms are located entirely within the association. Most farms extend into the steep Bodine-Dellrose association, which provides most of the pasture. Corn, wheat, and oats are the chief grain crops. Lespedeza, alfalfa, and soybeans are the main hay crops. Beef-cattle raising and dairying are the leading livestock enterprises. A few hogs are raised on most farms, and sheep are raised on a few farms. Much of the feed produced is fed to livestock on the farm. Corn is grown chiefly on the Armour, Huntington, and Lindside soils. Wheat, oats, lespedeza, and alfalfa are grown mainly on the Armour, Pace, and Etowah soils and less frequently on the Huntington soils, which are often flooded. Pasture, mostly unimproved, is grown chiefly on the more sloping areas of Armour, Pace, and Etowah soils, and on the smaller and more isolated areas of the cherty, wet soils of the first bottoms.

A very large part of the acreage in this association is suited to crops or pasture. A considerable part is well suited to intensive use for crops. The acreage of soils suitable for crops is small on many farms. This acreage has been used for row crops too often. Periodic overflow restricts the use of most of the soils of the first bottoms to summer annuals and pasture. Yields would be increased by the use of more suitable rotations, by applying enough nitrogen and potash, and by better control of water.

Bodine-Dellrose Association

The Bodine-Dellrose association occupies about 56,000 acres, or 20 percent of the county. It occurs in the western part and includes the Highland Rim escarpment area and most of the Central Basin area. The relief is predominantly strongly sloping to steep and is characterized by narrow, winding ridges and deep, steep-walled, V-shaped valleys. This highly dissected association has a well-developed dendritic drainage pattern and is well drained. The Bodine and Dellrose soils are the most extensive, but more important agriculturally are the less extensive Mountview, Mimosa, Baxter, Pace, Huntington, and Lindside soils. Other soils of small acreage are the Armour, Etowah, Lobelville, and Greendale. Although they comprise a considerable acreage, Rockland and the strongly sloping and moderately steep phases of the Mimosa, Baxter, and Colbert very rocky soils are of little agricultural importance.

In this association the Bodine soils occur on the steep ridge slopes. The Dellrose soils are on the strongly sloping to steep slopes of the Central Basin (fig. 3). Mountview and Baxter soils occupy most of the gently sloping and sloping ridgetops. Mimosa soils are gently to strongly sloping and are at the foot of high ridges and outlying ridges that are free or generally free of colluvial material. Pace soils occupy older colluvial slopes, and Armour and Etowah soils occur on stream terraces. Huntington and Lindside soils occupy areas on stream bottoms and local alluvium; much of their material has been washed from phosphatic limestone. The Lobelville and Greendale soils occur in narrow, steep-walled valleys and on foot slopes that overlie the Chattanooga shale formation.

Areas suitable for cultivation are limited largely to ridge crests, old colluvial benches, and first bottoms. Most crops are grown on the Mountview and Baxter soils of the ridge crests, on smoother areas of Mimosa soils on uplands, and on the Huntington and Lindside soils of the first bottoms and local alluvial areas. The Mountview soils and part of the Mimosa soils contain little chert. The other soils contain chert in amounts that interfere with cultivation. Because of their generally strong to steep slopes, high chert content, and low fertility, the Bodine soils are unsuited or, at least, very poorly suited to crops and pasture. Although they are moderately fertile, a large part of the acreage occupied by Dellrose soils is unsuited to crops because of steepness and chertiness.

The soils of subclasses VIIs and VIe predominate in this association, but the soils of subclasses IVe, IIe, and IIIe occupy a considerable acreage. Most of the cropland consists of the soils of subclasses IIe, IIs, and IIIe. The acreage of class I soils is very small.

The number of people living in this association is relatively small. The farm buildings are located along the principal roads on the ridgetops or in the narrow valleys. About 65 percent of the association is in timber or unimproved pasture. Most of the farms are of the small general type on which some livestock is raised. A fairly large part of the association is owned and used for pasture by farmers living in the Armour-Huntington-Lindside association. Corn, oats, wheat, and lespedeza, in that

Figure 3.—**Armour soils below a steep upland consisting chiefly of Dellrose soils on the lower slopes and Bodine soils on the upper slopes.**

order, are the principal crops on soils of the uplands, old colluvial slopes, and stream terraces. Corn, lespedeza, and soybeans are grown mainly in the bottom lands. The Bodine soils are mostly in forest and pasture. Most of the acreage of the Dellrose soils has been cleared and is used for pasture and corn.

The forest on this association is chiefly upland hardwoods that vary greatly in quality. White oak, post oak, red oak, chestnut oak, sourwood, and hickory grow on the Bodine, Mountview, and Baxter soils. On Dellrose soils are chinquapin oak, hackberry, black locust, white ash, black walnut, yellow-poplar, white elm, mulberry, honeylocust, black cherry, redcedar, Osage-orange, sycamore, boxelder, sassafras, beech, and sumac. Rockland supports stands of redcedar or of redcedar and mixed hardwoods.

Most farms on this association have a small or very small acreage that is suitable for crops. The cherty silt loams of the Huntington and Lindside series and other soils of the valleys are suited to fairly intensive use, as are the Mountview soils and other soils of the gently sloping ridge crests. Most of the upland is very poorly suited to crops and poorly suited to pasture. It is now in forest and pasture. Only a few soils on this association yield as much as they would yield under improved management.

Dickson-Mountview-Lobelville Association

The Dickson-Mountview-Lobelville association is the largest soil association in the county. It occupies about 139,000 acres, or about 50 percent of the county. It occurs on the Highland Rim and extends from north to south through the county. The large low-lying ridges are gently sloping or nearly level and have stronger slopes near the drainageways. Also in this association are narrow level stream bottoms, large level upland plains, and shallow upland depressions. The areas have a dendritic drainage pattern that is not well developed. The streams are neither numerous nor well entrenched. Moderately well drained and somewhat poorly drained soils predominate, but many soils are poorly drained.

The Dickson and Mountview soils occupy the largest part of this association. The Lobelville, Lawrence, Guthrie, and Sango soils are extensive and occupy about equal parts. The Lobelville soils are more widely distributed than any of the other soils. The Baxter, Cookeville, Lee, Greendale, Captina, and Humphreys soils are of moderate extent. A small acreage of other soils is included.

The Dickson soils occupy gently sloping uplands, the Sango soil occupies level uplands, and Lawrence and Guthrie soils occupy level to depressed uplands. The upper layers of these soils generally contain no chert, stones, or gravel; their subsoil is compact and slowly pervious. The Mountview soils, also relatively free of chert, are on gently sloping and sloping uplands. Lobelville and Lee soils occupy level bottom lands and local alluvial areas. The Baxter soils are cherty and occur principally on the steeper ridge slopes and along the larger drainageways. The Greendale soils occur as recent alluvial-colluvial deposits on foot slopes in slight depressions, and along small drainageways. The Captina soils are on fairly high and low stream terraces, and Humphreys silt loam is on low stream terraces. Soils having a silt loam texture are most common in this association.

Soils of subclass IIe are the most extensive in this association. A large acreage is occupied by soils of subclasses IIw, IIIe, IIIw, and IVw. Small areas of soils of subclasses IVe and VIe—mainly the Baxter soils—are scattered throughout the association.

Most of this association is in forests of low quality. About 35 percent is used for crops and pasture. A considerable acreage is in broomsedge, weeds, briers, and bushes.

Most of the farms of this association are widely separated along the principal roads. They are mainly general farms, livestock farms, and dairy farms, but some are subsistence and part-time farms. Corn, oats, wheat, barley, and grain sorghum, in that order, are the leading grain crops. Lespedeza and soybeans are the chief hay crops. Sericea lespedeza and alfalfa are grown for hay on a small acreage. Soybeans and small acreages of cotton, potatoes, and burley tobacco are grown for cash crops. On many farms a little buckwheat is grown for hog feed. Some vetch and crimson clover are grown alone or with a small grain for cover crops, green manure, and seed.

The Dickson, Mountview, Sango, Captina, and Humphreys soils are moderately well suited to most crops and pasture plants. Yields are low to medium for corn and other crops that are not very resistant to drought. The Lobelville soils are used mainly for corn, summer hay, soybeans, and pasture, for which they are well suited. Most crops and pasture plants grow well on the Greendale soils. Lawrence silt loam is poorly suited to most crops, but lespedeza, soybeans, grain sorghum and other summer annuals grow fairly well. This soil is moderately well suited to pasture. The Guthrie and Lee soils are poorly suited to crops but are fairly well suited to well-managed pasture. The small acreage planted to alfalfa consists of well-drained soils, chiefly Mountview and Cookeville.

The extensive forest in this association contains the blackjack oak-hardwoods, the upland hardwoods, and the bottom-land hardwoods forest types (*6*). Most areas of the blackjack oak-hardwoods forest type have been cut over and burned over. Its timber is commercially acceptable only for use as crossties, distillation wood, fuel wood, and the like. Typical trees are blackjack oak, post oak, southern red oak, white oak, blackgum, sourwood, white hickory, and pignut hickory. The upland hardwoods forest type grows on the more fertile, better drained, and more sloping soils. It consists of the trees of the blackjack oak-hardwoods forest type, and yellow-poplar, dogwood, black walnut, and a few redcedars. The bottom-land hardwoods forest type is on the more poorly drained Lawrence, Lobelville, Guthrie, and Lee soils. Its trees include willow oak, water oak, white oak, sweetgum, blackgum, red maple, sycamore, willow, and the hickories.

The soils of this association are generally low in natural fertility and organic matter, strongly to very strongly acid, and droughty. They are very easy to work and to conserve. They respond to good management, including proper fertilization. Management should include the use of adequate fertilizer and lime, suitable crops and rotations, and necessary water-control practices.

Mountview-Cookeville-Pembroke Association

This association occupies about 5,000 acres, or about 2 percent of the county. It is in the northern part of the Highland Rim and includes one of the best agricultural sections of the county. The relief is predominantly gently sloping to sloping, though there are nearly level stream bottoms. A few strongly sloping and moderately steep areas occur near the larger drainageways. South Prong Barren Fork Creek and Mud Creek drain the area in a north-northeast direction.

The upland soils make up most of this association. They are mainly the Mountview, Cookeville, and Pembroke soils. The Lobelville soils occupy most of the first bottoms. A small but important part of this association consists of the Decatur soils of the uplands and the Captina soils of fairly high and low stream terraces. Other soils are the Baxter, Lee, Taft, Dickson, Lawrence, Emory, Greendale, Hermitage, Lindside, and Etowah. Soils of a silt loam or silty clay loam texture predominate. All except the cherty Baxter soils are generally free of stones or chert.

This association consists mainly of soils of subclasses IIe and IIw, but a fairly large part is made up of soils in subclass IIIe. Soils of subclasses IIIw, IVe, and VIe occupy small acreages.

This association has a small farm population. The farms range from about 40 to 600 acres in size. They are mainly small general farms and dairy farms. About 80 percent of the land has been cleared. It is used for a wide variety of crops and for pasture. Management is only fair, and crop yields are medium. Most of the soils are well suited to crops and pasture, but a large part of the sloping areas of Cookeville and Decatur soils that is used for crops is severely eroded. Corn, oats, and wheat are the main grain crops. Lespedeza, soybeans, and alfalfa, in that order, are the chief hay crops. Vetch, or rye and vetch grown together, is the most common green-manure crop. A small acreage of sorghum is grown. The sorghum is made into molasses and marketed.

The forests are mainly on the Mountview and Cookeville soils of the uplands. They consist mainly of white oak, red oak, white hickory, pignut hickory, yellow-poplar, dogwood, black cherry, and black walnut. The bottom lands support a high proportion of water-tolerant species, including sweetgum, blackgum, willow oak, water oak, red maple, and white oak. Suitable trees on this association can produce large sawtimber of high quality.

A wide choice in the selection of crops and in types of farming is possible on most farms. The management requirements are not exacting. High crop yields can be maintained if crops are properly selected and rotated, if crops are adequately fertilized, and if water is controlled by channel improvement, contour cultivation, terracing, stripcropping, and establishing permanent sod where needed.

Holston-Monongahela-Tyler Association

The Holston-Monongahela-Tyler association covers about 11,000 acres, or 3.9 percent of the county. It occurs on the Highland Rim in the east-central part of the county. This association consists almost entirely of loamy alluvial soils. The relief is mainly gently sloping to level; a few sloping areas occur near drainageways. The dendritic drainage pattern is poorly developed. Typically, the many intermittent drainageways rise in fairly large poorly drained depressions. Soil drainage is highly variable.

Most of this association consists of the well-drained Holston, the moderately well drained Monongahela, and the somewhat poorly drained Tyler soils. The poorly drained Purdy soils occupy a large acreage. The Waynesboro, Nolichucky, Sequatchie, Whitwell, Staser, Hamblen, and Prader soils occupy a considerable acreage. The Holston, Waynesboro, and Nolichucky soils occur on the well-drained gently sloping and sloping stream terraces. The moderately well drained Monongahela and Whitwell soils occur on gently sloping and level stream terraces, and the well-drained Sequatchie soils occupy a small acreage on gently sloping stream terraces. The somewhat poorly drained Tyler and the poorly drained Purdy soils occupy level and depressional positions on stream terraces. The well-drained Staser, the somewhat poorly to moderately well drained Hamblen, and the poorly drained Prader soils occur on the narrow level to gently sloping first bottoms and small areas of local alluvium. The soils of this association generally have a surface soil of very friable loam and fine sandy loam and a subsoil of friable to firm sandy clay loam and clay loam.

Subclass IIe soils predominate in this association, but subclass IIIw soils comprise large acreages. Soils of subclasses IIw and IIIe occupy a significant part. Class I and subclass IVe soils occupy very small acreages.

About 45 percent of the association is cleared and is being used for crops and pasture. Small general farms are the most common. A few beef cattle and hogs are raised on many of the farms. On a few farms dairying is the main enterprise. Corn, wheat, and oats are the chief grain crops. They are grown mostly on well-drained and moderately well drained soils on stream terraces. Cotton, sweet peppers, and potatoes are the chief cash crops. Lespedeza and soybeans are the principal hay crops. A small amount of alfalfa is produced, chiefly on the Waynesboro and Nolichucky soils.

Except for the somewhat poorly drained Tyler soils, the poorly drained Purdy and Prader soils, and the severely eroded and more sloping soils on stream terraces, the soils of this association are physically suited to most of the common crops. They are naturally low in fertility, however, and the yields of most crops are low or only medium. These soils respond well to good management, especially to the use of complete fertilizers and lime. The response, however, is generally not so great or so lasting as the response of soils in the Cookeville-Cumberland-Hermitage association. Most of the soils are low in organic matter. Most farmers do not grow alfalfa on Holston and Nolichucky soils because of their low fertility.

As in the Dickson-Mountview-Lobelville association, the extensive forests in this association consist of the blackjack oak-hardwoods, upland hardwoods, and bottom-land hardwoods forest types (*6*). Typical trees of the blackjack oak-hardwoods type are blackjack oak, post oak, red oak, white oak, blackgum, sourwood, white hickory, and pignut hickory. These trees are used commercially only for crossties, distillation wood, fuel wood, and similar products. The upland hardwoods forest type consists chiefly of white oak, southern red oak, white and pignut hickories, blackgum, yellow-poplar, red maple, dogwood, and a few black walnut trees and shortleaf pines. The bottom-land hardwoods forest type occurs principally on the Tyler, Purdy, and Prader soils. It consists mainly of willow oak, water oak, sweetgum, blackgum, red and silver maples, white oak, willow, alder, and sycamore. Little attention is given to forest management, and most forested areas are generally heavily cut over and burned over.

This soil association has a relatively small farm population. A fairly wide variety of crops can be grown, but generally the small size of the farm limits the choice of the type of farming. The soils of this association are very easy to work and to maintain in good tilth. They can be worked within a wide range of moisture content. The management requirements are not very exacting.

Mountview-Baxter-Lobelville Association

The Mountview-Baxter-Lobelville association comprises about 15,000 acres, or 5.8 percent of the county. It is predominantly gently sloping to sloping. Some strongly sloping areas occur on the ridge slopes and near the larger drainageways. A moderately well defined dendritic drainage pattern is characteristic of the association, but a considerable part has a karst relief. The upland soils have a silt loam or cherty silt loam texture. They are well drained and medium to low in natural fertility. The soils of the stream bottoms, stream terraces, and depressions have a silt loam texture. They are mainly moderately well drained or somewhat poorly drained and medium in natural fertility.

The Mountview and Baxter soils are the main soils on the uplands, but Cookeville soils occupy an important acreage. Lobelville soils occupy most of the first bottoms and parts of the local alluvial areas. Greendale soils occupy a small but important acreage. They occur on recent alluvial-colluvial deposits at the base of slopes, along small drainageways, and in depressions. The moderately well drained Captina soils and well drained Humphreys silt loam are the chief soils on the stream terraces. Small parts of the association consist of soils of the Dickson, Sango, Lawrence, Guthrie, Decatur, Pembroke, Hermitage, Pace, Dunning, Lee, Emory, Lindside, Taft, Robertsville, Cumberland, and Etowah series.

Soils of subclasses IIe, IIIe, and IIw make up the greater part of this association. Most of the rest consists of soils of subclasses IVe, VIe, and IIIw.

This association has a relatively large farm population. About 85 percent of the land is used for crops and pasture. General farming that includes the raising of beef cattle and hogs is dominant. Corn, oats, and wheat are the principal crops. Small acreages of cotton, tobacco, grain sorghum, soybeans, buckwheat, and potatoes are grown. Lespedeza and alfalfa are the most common hay crops. On many farms vetch, or rye grown with vetch, is used as a green-manure crop in rotation with corn. The most common pasture mixture is orchardgrass or fescue with whiteclover. The soils are moderately well suited to crops and pasture. They are moderately low in organic matter and plant nutrients. Because of droughtiness and lower fertility, yields are somewhat less on this association than they are on soils of the Waynesboro-Cumberland-Hamblen association and the Cookeville-Cumberland-Hermitage association.

Forests on this association are chiefly in small tracts. A few forested areas range from 50 to 60 acres in size. The upland hardwoods forest type is dominant on the forested well-drained soils; the bottom-land hardwoods type is dominant on the somewhat poorly and poorly drained areas. The quality of the red oak, white oak, post oak, yellow-poplar and other upland trees is about the same as the quality of these trees on the Waynesboro-Cumberland-Hamblen association and the Cookeville-Cumberland-Hermitage association. The trees grow to a large size. The trees of the upland hardwoods forest type, including white hickory, black walnut, dogwood, and red maple, are displaced on the somewhat poorly and poorly drained areas by willow oak, water oak, sweetgum, blackgum, sycamore, beech, alder, and willow.

The farmers of this association have a fairly wide choice in selection of crops and type of farming. If land use is well planned, management is not exacting.

Waynesboro-Cumberland-Hamblen Association

The soils of the Waynesboro-Cumberland-Hamblen association are among the most productive in the county. This association comprises about 29,350 acres, or 10.5 percent of the county. It consists mainly of alluvial soils that developed from materials of sandstone and limestone. The relief is predominantly gently sloping to sloping but is nearly level on stream bottoms. A few strongly sloping to moderately steep areas border the larger drainageways and occupy ridge slopes. This association has many small, shallow depressions and a few large depressions. It is drained by Bradley, Bean, and Betsy Willis Creeks and their tributaries. These creeks flow southward into Wood Lake and the Elk River at the southern boundary of the county.

The Waynesboro and Cumberland soils of the stream terraces and the Hamblen soils of the first bottoms are the most widely distributed soils in this association. A considerable and important part of the association is occupied by the Holston, Etowah, Sequatchie, Whitwell, and Captina soils of the stream terraces, the Hermitage and Emory soils of the colluvial slopes, and the Staser and Dunning soils of the first bottoms. Soils of less extent are members of the Taft, Robertsville, Monongahela, Tyler, Purdy, Swaim, Prader, Lindside, and Bruno series. A small acreage of the uplands consists of Cookeville, Baxter, Talbott, and Decatur soils. The soils are chiefly silt loam, loam, and fine sandy loam, but there is much silty clay loam and clay loam. The soils are generally free of stones or contain only a few cobbles or pieces of chert. These soils are intricately associated, and their boundaries are seldom distinct.

This association is the most intensively used in the county. It has the largest acreage of severely eroded soils. Too frequent use for row crops has caused the erosion, especially on the sloping and strongly sloping soils. Most of the association has been cleared and is used for crops and pasture. Forests occur mainly on the poorly drained soils, and on Rockland, moderately steep, Rockland, sloping, and the steeper upland slopes. Farming is diversified. General farming that includes the raising of beef cattle, hogs, and other livestock is the most common. Dairying and the growing of grain are also common. Management is generally at a higher level than in other soil associations, and crop yields are relatively high. Most of the soils are suited to crops and pasture. This association has a large rural population and the most productive farms in the county.

Soils of subclass IIe comprise the largest and most important part of this association. Soils of subclasses IIw, IIIe, IIIw, IVw, and IVe occupy a considerable acreage. The acreage of the soils of class I and subclass VIe is small but important. The largest group of class I soils in the county are the level areas of the Staser, Sequatchie, and Emory soils in this association.

The soils of this association are well suited to nearly all of the crops and pasture plants commonly grown in the county. If adequately limed and fertilized, alfalfa can be grown on all the important well-drained soils that are not likely to be flooded. Corn, oats, and wheat are the principal grain crops; barley and rye are moderately important. A small amount of grain sorghum is grown. Potatoes, cotton, and soybeans occupy only small acreages, but they are important cash crops. Alfalfa and lespedeza are the main hay crops. Excess growth of pasture in spring furnishes some hay. Vetch and crimson clover, seeded alone or with a small grain, are grown for cover crops, green manure, and seed. Potatoes are grown chiefly on the Cumberland and Waynesboro soils and the higher lying areas of the Sequatchie soils. The soils of the first bottoms and the somewhat poorly and poorly drained soils of stream terraces are used mainly for corn, soybeans, and annual hay; but many areas are used for permanent pasture.

Forests in this association are the upland hardwoods and bottom-land hardwoods types. The upland hardwoods forest type dominates on the well-drained sites where the trees can produce large sawtimber of high quality. The important species include southern red oak, white oak, black oak, post oak, yellow-poplar, white hickory, and pignut hickory. Trees of the bottom-land hardwoods forest type prevail on the poorly and somewhat poorly drained sites, mainly on the Purdy, Robertsville, Tyler, Taft, and Prader soils. The trees include willow oak, water oak, white oak, sweetgum, blackgum, red maple, sycamore, alder, beech, and willow.

The farmers of this association have a wide range in selection of crops and types of farming. Most farms have enough soils suited to row crops if the soils are properly managed. Soils that are less well suited to intensive use could be improved by proper selection of crops, suitable rotation of crops, adequate fertilization, channel improvement, drainage, and, in places, stripcropping, contour cultivation, and terracing.

Cookeville-Cumberland-Hermitage Association

This soil association occupies about 3,600 acres, or 1.3 percent of the county. It is on the most eastern part of the Highland Rim, which is locally called "The Barrens," and is one of the better agricultural sections of the county. The area has a predominantly gently sloping to sloping karst relief with many slight depressions. The few stream bottoms are level. A few strongly sloping areas are near the larger drainageways. The soils are generally fertile and well drained.

Cookeville soils occupy the largest part of the uplands in this association. Cumberland soils occupy most of the stream terraces, and Hermitage soils occupy the major part of the colluvial slopes. The Pembroke, Decatur, Emory, Captina, and Lobelville soils are fairly extensive. Less extensive are the Baxter, Mountview, Robertsville, Taft, Etowah, Swaim, Pace, Greendale, Lee, Dunning, and Lindside soils. The soils of this association occur mostly in medium-sized and small areas. It is difficult to distinguish the soils on the well-drained stream terraces from those on the uplands. Except for the Baxter soils and cherty Hermitage soils, all are generally free of stones or chert.

This association consists mainly of soils of subclasses IIe, IIIe, and IIw. The soils of subclasses IVe, VIe, IIIw, and IVw are not extensive. Class I soils occupy a very small part of the association.

Some of the most productive farms of the county are in this association, but the population is small. About 90 percent of the land is used for crops and pasture. The forests are mostly on small woodlots. A few tracts are larger than 20 acres, but none exceed 70 acres. Farms range from 50 to 350 acres in size and average about 135 acres. General farming that includes the raising of livestock is the most common type of farming. Beef cattle, hogs, and sheep, in that order, are the principal livestock. Dairying is a major enterprise on a few farms. Most of the soils are well suited to crops and pasture. A wide variety of crops is grown; management is at a fairly high level; and crop yields are relatively high.

The soils of this association are well suited to all the crops and pasture plants commonly grown in the county. If adequately limed and fertilized, alfalfa can be grown on the well-drained soils. Corn, wheat, and oats are the chief grain crops. Alfalfa and lespedeza are the main hay crops. A considerable acreage is used for pasture made up of orchardgrass or fescue mixed with whiteclover. Barley, soybeans, cotton, grain sorghum, red clover, button clover, vetch, rye, crimson clover, and potatoes are grown on small acreages. The soils of the first bottoms and the somewhat poorly drained and poorly drained stream terraces are used chiefly for corn, soybeans, and annual hay crops, but many areas are used for permanent pasture.

The upland hardwoods forest type dominates in the well-drained sites where the trees can produce large sawtimber of high quality. The common trees are southern red oak, white oak, yellow-poplar, post oak, white hickory, and pignut hickory. On the poorly drained sites, trees of the bottom-land hardwoods forest type are common. They include willow oak, water oak, sweetgum, red maple, and blackgum. Although this soil association is primarily agricultural, its soils will grow many kinds of trees.

The soils of this association have a broad range in use suitability and do not have to be used for crops not suited to them. Crop yields, however, are low on many of the more sloping soils where erosion is active. Further erosion should be prevented by controlling runoff. Most farms need a better selection of crops and crop rotations, as well as adequate fertilization and liming.

Rockland-Bouldery Colluvial Land Association

This soil association consists of rough rocky slopes. It occupies the predominantly steep slopes of that part of the Cumberland Mountains lying between the higher sandstone plateaus and lower lying limestone valleys (fig. 4). The association covers about 7,000 acres, or 2.5

***Figure 4.*—Forested area of Rockland, moderately steep, on the Cumberland Escarpment. In foreground, Sequatchie fine sandy loam, eroded gently sloping phase, on left and Hamblen fine sandy loam on right.**

percent of the county. Rock outcrops, loose stones, and boulders abound. The highest part of this association consists of a nearly barren, very steep to vertical sandstone escarpment. Below this escarpment and extending about one-fourth the distance downslope is a strongly sloping and sloping area of sandstone boulders and sandstone soil material. The lower slopes are mainly moderately steep and steep. They consist chiefly of limestone Rockland with a few scattered areas of complex very rocky soils. Drainage is moderate to rapid, but the drainage pattern is not well defined.

About 70 percent of the association is moderately steep and sloping Rockland. Nearly 25 percent is Bouldery colluvial land, strongly sloping phase. The rest is about equally divided between Rock outcrop and strongly sloping and moderately steep Mimosa, Baxter, and Colbert very rocky soils. Soils of subclasses VIIs and VIe make up practically all of this association.

About 98 percent of this association is in forest. The rest consists almost entirely of Mimosa, Baxter, and Colbert very rocky soils; it is used for summer pasture or is idle. The Bouldery colluvial land supports a mixed hardwoods forest consisting chiefly of oaks, poplar, locust, maple, walnut, redbud, and dogwood. Rockland and the Mimosa, Baxter, and Colbert very rocky soils support stands of redcedar in many places, and in other places there are mixed hardwoods and cedar or mixed hardwoods alone. Practically all the area has been cut over from time to time.

Most of the land is owned by farmers who live in the adjoining limestone valleys and supplement their income by selling forest products, mainly sawtimber and fence posts. Most of the cedar that is cut is shipped to be made into chests.

Hartsells-Muskingum Association

The Hartsells-Muskingum soil association occupies 0.7 percent of the county. It occurs in four small areas on the Cumberland Plateau in the extreme eastern part of the county. The relief is mainly gently sloping to sloping. Some narrow strongly sloping strips extend along drains. A well-developed dendritic system drains the association. This drainage system terminates at the very steep or almost vertical sandstone escarpment that borders this association in nearly all parts of the county. The soils are fine sandy loam or stony fine sandy loam.

The Hartsells soils make up about 75 percent of this association and occupy all the gentle slopes and parts of the moderate slopes. Muskingum stony fine sandy loam, strongly sloping phase, makes up the rest. It occurs on all the strong slopes and on shallow parts of the moderate slopes. The Hartsells soils are well drained, shallow to very deep to bedrock, and practically free of stone. The Muskingum soil is excessively drained, shallow to deep to bedrock, and stony or very stony. Many outcrops of bedrock occur.

Soils of subclasses IIe, IIIe, and VIIs make up this association. The Hartsells soils are in subclasses IIe and IIIe, and the Muskingum soil is in subclass VIIs.

No one lives on this association. Logging roads lead into it from adjoining Grundy County; within Coffee County, there are rough logging roads and trails up the steep escarpment. About 95 percent of the association is in hardwoods of poor quality. The rest has been farmed but is now abandoned. The soils are lying idle or reverting to forest. Typical trees are post, white, red, and scarlet oaks and pignut hickory. Lumbering, chiefly cutting of crossties, is now the only source of income. The low natural fertility of the soils and their remoteness from farming communities impede agricultural development.

If cultivated, the Hartsells soils would be well suited to truck crops, small grains, and pasture. Even under good management, they would be only fair for corn and most deep-rooted legumes. Because of its stoniness, generally shallow depth, low productivity, and droughtiness, the Muskingum soil would be very poorly suited to cultivated crops and poorly suited to pasture.

Use and Management of Soils

Each soil in Coffee County has characteristics that distinguish it from the others. In spite of these differences, many soils need much the same management and are similar in their suitability for use. In the following pages the soils of the county have been placed into groups according to their relative suitability for use, kinds of management problems, and, to a large degree, their dominant physical characteristics.

Capability Groups of Soils

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

The capability unit, sometimes called a management group, is the lowest level of grouping. A capability unit is made up of soils similar in kind of management they need, in risk of damage, and in general suitability for use.

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 if the plant cover is not maintained; "w" signifies that excess water retards plant growth or interferes with cultivation; and "s" shows that the soils are shallow, droughty, or unusually low in fertility.

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 the land classes except class I may have one or more subclasses.

In classes I, II, and III are soils that are suitable for annual or periodic cultivation of annual or short-lived crops. 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. These 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 and range, as woodland, or for wildlife.

Class V soils do not occur in Coffee County. In other places they are nearly level and gently sloping but are droughty, wet, low in fertility, or otherwise unsuitable 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 or forest products.

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

Capability Classes and Subclasses in Coffee County

In the following outline, the capability classes and subclasses in Coffee County are defined. The brief description of each subclass gives the general nature of the dominant soils in the subclass.

Class I.—Soils that are easy to farm and have no more than slight limitations in use. They may be intensively cultivated without special measures to control excess water or erosion. If managed well, they may be expected to produce high yields. No subclasses of class I are used.

Class II.—Soils that can be used for tilled crops and have only slight risks of erosion or other limitations.
- Subclass IIe: Gently sloping soils subject to erosion.
- Subclass IIw: Imperfectly and moderately well drained bottom-land and terrace soils.
- Subclass IIs: Well and moderately well drained cherty local alluvial-colluvial soils.

Class III.—Soils that can be used for tilled crops but under moderate risk of erosion, excess water, or other limitations.
- Subclass IIIe: Sloping soils subject to erosion.
- Subclass IIIw: Imperfectly drained upland and terrace soils and poorly drained bottom-land soils.

Class IV.—Soils that have severe limitations if used for cultivation and, if so used, require extreme care.
- Subclass IVe: Severely eroded sloping soils or strongly sloping soils subject to severe erosion.
- Subclass IVs: Level and gently sloping soils limited by droughtiness, stoniness, or low fertility.
- Subclass IVw: Poorly drained upland and terrace soils.

Class VI.—Soils too steep, too eroded, too stony, or too shallow for cultivation except occasionally to seed long-producing pasture or forage, or to plant trees.
- Subclass VIe: Strongly sloping, moderately steep, and steep soils, either severely eroded or subject to severe erosion.

Class VII.—Soils too steep, too stony, too erodible, or too droughty for cultivation.
- Subclass VIIs: Cherty and stony soils and miscellaneous land types that are extremely stony, shallow, steep, low in fertility, low in moisture-supplying capacity, severely eroded, or limited by a combination of these factors.

Capability Units in Coffee County

A capability unit consists of soils that need and respond to similar management. The capability unit is identified by a symbol, such as IIe-1. In this symbol the Roman numeral II represents the class, the small letter "e" the subclass, and the arabic numeral 1 the unit within the subclass. No subclass is used for class I soils, but a capability unit may be designated as I-1.

The soils of Coffee County have been grouped into 20 capability units. Described for each capability unit are the characteristics the soils have in common, the uses to which the soils are suited, and the management the soils require.

Capability unit I-1

The soils of capability unit I-1 occur on level to gently sloping bottom, colluvial, or terrace lands. Most of them are deep or very deep, well-drained, brownish soils that are likely to be flooded or washed by water from adjacent slopes. The overflow waters and the wash from adjacent slopes tend to replenish the plant nutrients and organic matter, but periodic flooding may limit the use suitability of these soils.

The soils of capability unit I-1 are:

Emory silt loam.
Greendale silt loam.
Huntington silt loam, phosphatic phase.
Huntington silt loam, local alluvium phosphatic phase.
Huntington cherty silt loam, phosphatic phase.
Sequatchie fine sandy loam, level phase.
Staser fine sandy loam.
Staser fine sandy loam, local alluvium phase.

The soils of this unit produce high yields of suitable crops without the use of amendments. They are permeable and generally moderate to high in organic matter and moderate to high in available moisture. They have very good to excellent tilth, are easily worked, and can be worked within a fairly wide range of moisture content. The Huntington soils are particularly high in phosphorus. Huntington cherty silt loam, phosphatic phase, contains a large quantity of chert and gravel, but the pieces are generally small and do not materially hinder tillage. Largely because they retain plant nutrients and are not likely to erode, the soils of this unit can be kept highly fertile.

Use and suitability.—The soils of capability unit I–1 are used largely for crops. They are well suited to intensive use for corn, soybeans, lespedeza, truck crops, and other summer annuals. Areas not likely to be flooded and areas that are flooded only for short, infrequent periods are suited to alfalfa, tobacco, cotton, small grains, potatoes, and crimson clover. Small grains, however, often lodge, and on most of these soils they mature later than they do on the upland soils. Vetch and crimson clover can be grown for soil improvement. Little acreage of these soils is used for truck crops other than those grown for home use. Large acreages of corn and annual hay crops, mainly lespedeza and soybeans, are grown. A considerable acreage of soybeans is harvested for seed.

The soils of this unit are very well suited to pasture, but they are seldom used for it because they are so well suited to more intensive use. They are especially valuable for pasture because they normally remain moist and productive during hot dry periods. These soils are well suited to the pasture plants commonly grown in the county. Orchardgrass or fescue mixed with white or Ladino clover is well suited and is most commonly grown. Sudangrass, millet, and lespedeza can be grown successfully as supplementary summer pasture.

Management.—A systematic rotation of crops is not commonly practiced. Many farmers break the sequence of row crops, mainly corn, with a hay crop every few years. Some farmers alternate a row crop with a green-manure crop. In some areas, row crops have been continuously grown for many years.

The selection of suitable crops is very important to the management of these soils. Suitable crops can be grown successfully year after year by the use of ordinary farming practices. A short rotation that includes legumes and green-manure crops as often as practical is desirable. A corn-vetch or crimson clover-corn rotation is well suited and is used by some farmers. Corn yields generally can be increased by sowing vetch, crimson clover, or some other legume between the corn rows and turning under the legume as a green-manure crop. A rotation of a small grain and lespedeza or a small grain and soybeans is well suited to the soils of this unit. Also well suited are cotton, potatoes, or another row crop and a green-manure crop. A longer rotation of potatoes and alfalfa or red clover is well suited to areas that are not likely to be flooded. A few farmers that have large acreages of suitable cropland prefer to use an even longer rotation consisting of a row crop and pasture.

The use of lime and fertilizer varies greatly, but generally only small quantities of either are used. Many farmers think that fertilization is not necessary, because nearly all the soils may receive fertile overwash or other deposits of new sediments. Corn and lespedeza are seldom fertilized. Small grains and soybeans commonly are lightly fertilized. Potatoes and alfalfa generally are heavily fertilized. The crop that follows potatoes seldom receives any amendments.

The soils of capability unit I–1 are generally well supplied with plant nutrients and organic matter. The Huntington soils are high in phosphorus and do not respond to phosphate, but they generally respond to nitrogen and potash. The other soils in this group respond to complete fertilizers. Some crops may need a moderate application of potash and phosphate. This need depends mainly on the crop grown and the previous cropping system. Nitrogen fertilizers may be needed for continuous cropping, but a legume in the rotation generally supplies adequate nitrogen for good yields, especially yields of the first crop following the legume. The organic matter of areas that are not silted can be maintained by the use of crop residues, green-manure crops, or barnyard manure.

Special tillage or cropping practices for maintenance of tilth and water control are not usually needed. The soils do not ordinarily erode. It may be necessary to use hedges, levees, or diversion ditches to protect the soils of this unit from flood currents and runoff from higher land. Channel improvement of some of the smaller streams and intermittent drainageways may be feasible in controlling floodwater. On a few small areas the scouring by overflow waters may be controlled by permanent sod.

Management of pasture consists chiefly of supplying the needed amendments to suitable pasture plants. The pasture should be properly grazed and droppings scattered. It is not difficult to control weeds on pasture that is adequately fertilized and properly grazed, but excess herbage and undesirable plants should be mowed. The pasture clippings, especially if there is an excessive growth late in spring and early in summer, can be used for hay and silage.

Capability unit IIe–1

The soils of capability unit IIe–1 are generally deep to very deep, well drained, and gently sloping. They occur on uplands, stream terraces, or old colluvial lands. As a group they have a friable brownish surface soil and a permeable subsoil. Most of the soils are slightly or moderately eroded.

The soils of capability unit IIe–1 are:

Armour silt loam, eroded gently sloping phase.
Cookeville silt loam, gently sloping phase.
Cookeville silt loam, eroded gently sloping phase.
Cumberland silt loam, eroded gently sloping phase.
Cumberland silt loam, gently sloping phase.
Decatur silty clay loam, eroded gently sloping phase.
Etowah silt loam, eroded gently sloping phase.
Etowah silt loam, eroded gently sloping phosphatic phase.
Hermitage silt loam, eroded gently sloping phase.
Hermitage silt loam, gently sloping phase.
Pembroke silt loam, eroded gently sloping phase.
Sequatchie fine sandy loam, gently sloping phase.
Sequatchie fine sandy loam, eroded gently sloping phase.
Waynesboro loam, gently sloping phase.
Waynesboro loam, eroded gently sloping phase.

These soils are easy to very easy to work and to conserve. In most places they contain no stones. They have a moderate to high amount of organic matter. They readily absorb moisture and retain it well. Most of these soils are medium to strongly acid.

Use and suitability.—Most of the acreage of the soils of this unit is used for crops and pasture. A small part is in timber. The soils are suited to a wide variety of crops, including corn, small grains, cotton, potatoes, and tobacco. They are also suited to alfalfa, Ladino clover, crimson clover, vetch, orchardgrass, and fescue. A considerable acreage is used for pasture, most of which is grown in a rotation. These soils are suited to a wide variety of pasture plants. Potatoes are grown chiefly on the soils having a loamy texture, principally the Waynesboro, Sequatchie, and Cumberland soils. Cotton is grown on most of these soils, but probably the largest acreage of cotton is grown on the Waynesboro soils. These soils are well suited to vegetables, but potatoes is the only vegetable grown extensively. Nursery stock also grows well on these soils.

Management.—Systematic rotations probably are used more on the soils of this unit than on the soils of any other unit. With careful management, row crops can be grown every second or third year. A common rotation consists of corn followed in fall by a small grain that is overseeded with lespedeza in the spring and followed by vetch, or rye and vetch, that is turned under the following spring before corn is planted again. Other common rotations are corn followed in fall by vetch, or rye and vetch, that is turned under before corn is planted; and corn followed by a pasture mixture of fescue or orchardgrass and Ladino clover that remain 2 to 4 years before corn is planted again. A small grain-lespedeza rotation is well suited. A rotation of potatoes followed by alfalfa or pasture for 2 to 4 years is suitable and is commonly used. Alfalfa, red clover, and other deep-rooted crops grow well in rotations on the soils of this unit.

The soils of this unit generally need slight to moderate applications of lime, nitrogen, and potash. Except for the Armour soil, they also need a moderate amount of phosphate for high yields of most of the common crops. All the soils respond well to adequate fertilization. Lime, phosphate, and potash are required to establish and maintain high yields of legumes, and boron is usually required for alfalfa. Winter cover crops and green-manure crops are useful for conserving soil moisture, improving tilth, and supplying nitrogen and humus. Nitrogen is needed for high yields of nearly all crops except legumes and the crops that immediately follow the legumes. A heavy application of a complete fertilizer is generally needed for vegetables, tobacco, and potatoes.

Good tilth is easily maintained. The soils can be tilled within a fairly wide range of moisture content without being seriously damaged. If suitable crops and adequate amendments are used, it is not difficult to control erosion and to conserve soil moisture. All cultivation should be on the contour. Terracing or stripcropping is needed in some places. The waterways should be kept in permanent sod. Because moisture is needed during dry periods, irrigation may be practical where fertility is kept at a high level, especially for high-value crops, such as tobacco and vegetables, and for pasture for dairy cows. To determine if irrigation is feasible, the value of increased yields should be compared with the cost of irrigation.

Good management, especially proper seeding, is needed for high yields of good pasture. Regulated grazing and adequate fertilization are generally effective in controlling weeds and keeping production high, but excessive growth and undesirable plants generally need to be mowed. Droppings on heavily grazed areas should be scattered.

Capability unit IIe–2

Capability unit IIe–2 consists of gently sloping well-drained soils of uplands and old colluvial slopes. These soils have a large amount of chert on the surface and throughout the profile, or they are shallow to a cherty subsoil. Depth to bedrock ranges from shallow to very deep.

The soils of capability unit IIe–2 are:

Baxter cherty silt loam, gently sloping phase.
Mountview silt loam, gently sloping shallow phase.
Mountview silt loam, eroded gently sloping shallow phase.
Pace cherty silt loam, eroded gently sloping phosphatic phase.
Pace cherty silt loam, eroded gently sloping phase.

These soils contain a small to moderate amount of organic matter. They are medium to very strongly acid and permeable to air, water, and roots. Their water-supplying capacity is low to moderate. The chert fragments interfere with tillage and cause some droughtiness.

Use and suitability.—A considerable acreage of the soils of this unit is in forest, but much has been cleared and is used for pasture or crops. These soils are fair to good for crops and pasture. They are suited to a wide variety of crops, but high production is more difficult to maintain than on the soils of capability unit IIe–1. They are well suited to early vegetables, small grains, crimson clover, red clover, and other early maturing crops. Corn and other crops sensitive to drought grow only fairly well. Grain sorghum and cotton apparently are better suited to these soils than corn. Although alfalfa grows fairly well, sericea lespedeza grows better than alfalfa at the low levels of fertility. These soils are well suited to pasture.

Management.—A systematic rotation is not generally used. Most farmers break the sequence of row crops with a crop of oats, wheat, or other small grain. The small grain is followed by lespedeza or vetch, or a combination of them, and then corn or cotton. The sequence of crops, however, and length of time between close-growing crops or green-manure crops is generally very irregular. The use of winter cover crops for winter pasture and green manure is fairly common. Commonly used are oats, rye, vetch, or a combination of vetch and rye or crimson clover and barley. Crop rotations lasting 2 years or longer should be used. Probably suitable for intensive use is a rotation of corn followed by a cover crop of vetch, or a small grain and vetch, that is turned under before corn is planted again. Because tilling is difficult, a more suitable rotation may be corn or cotton followed by a fall-seeded pasture mixture or spring-seeded sericea lespedeza for 3 to 5 years.

Almost all of these soils need applications of lime, phosphate, potash, and nitrogen. Pace cherty silt loam, eroded gently sloping phosphatic phase, needs less phosphate than the other soils. The use of lime, phosphate, and potash is essential for a good growth of alfalfa, red clover, and other legumes. Nitrogen is needed for high yields of all crops except possibly the legumes. Potash is generally needed for all crops, especially alfalfa, cotton, and tobacco. Barnyard manure is an excellent source of nitrogen, potassium, and organic matter. Green-manure crops should be turned under as often as possible to conserve soil moisture, improve tilth, and furnish nitrogen and organic matter.

Because these soils are moderately susceptible to erosion, they should be tilled on contour where feasible. Some areas should be stripcropped and terraced. Natural waterways should be planted in permanent sod. Diversion ditches to control runoff from higher slopes may be needed in places. The workability of most of the soils of this unit can be improved by removing the large, loose stones, but generally it is practical to remove stones only in very small areas.

Good pasture needs moderate to heavy applications of lime, phosphate, and potash. Nitrogen is also generally required to establish the pasture. A pasture mixture of fescue or orchardgrass and Ladino or white clover is well suited. Grazing should be controlled on these soils, and excess herbage and weeds should be mowed.

Capability unit IIe-3

Capability unit IIe-3 consists of gently sloping, well-drained, friable soils of the uplands and stream terraces. These soils generally have a very friable surface soil and a friable or friable to firm subsoil. They are generally deep or very deep to bedrock, strongly to very strongly acid, and very permeable to water, air, and roots. They absorb water readily. The water-supplying capacity ranges from moderately low to high.

The soils of capability unit IIe-3 are:

Hartsells fine sandy loam, gently sloping phase.
Holston loam, gently sloping phase.
Holston loam, eroded gently sloping phase.
Humphreys silt loam, gently sloping phase.
Mountview silt loam, gently sloping phase.
Mountview silt loam, eroded gently sloping phase.
Nolichucky loam, gently sloping phase.
Nolichucky loam, eroded gently sloping phase.

The soils have very good to excellent tilth, which is easily maintained. They are very easy to work and can be worked within a wide range of moisture content without serious injury. These soils are uneroded to eroded and are moderately easy to easy to conserve.

Use and suitability.—A large part of the soils of this unit is in forest. Nearly all areas of the Hartsells soils are in forest because of their remoteness. The cleared areas of the soils of this unit are used rather intensively for small grains, cotton, sorghum, lespedeza, sericea lespedeza, crimson clover, vetch, potatoes, sweet peppers and other early maturing or drought-resistant crops.

These soils are fair to good for crops. They are fairly well suited to moderately well suited to corn, tobacco, soybeans, alfalfa, and red clover. Alfalfa especially requires lime and heavy fertilization if good stands are to be maintained. These soils warm fairly early in spring and are well suited to early maturing truck crops. Because they tend to be droughty, these soils are not so suitable for intensive use as the soils of capability unit IIe-1.

Management.—The soils of this group need much more exacting management than the soils of capability unit IIe-1. A 2-year rotation can be used but longer rotations are better. A well-suited rotation consists of corn followed by 2 years of a fall-seeded small grain that is overseeded with lespedeza each spring and then seeded in fall to vetch, which is turned under before corn is planted again. A shorter rotation consists of corn followed in fall by a small grain that is overseeded in spring with lespedeza and followed in fall by vetch that is turned under before corn is planted in spring. Cotton, potatoes, or almost any of the other row crops commonly grown can be substituted for the corn in these rotations. A longer rotation consisting of a row crop followed by pasture or sericea lespedeza for 3 to 5 years is suitable.

For high yields of most crops, all the soils of this unit need applications of lime, phosphate, and nitrogen and most of them need potash. The need for amendments, however, varies considerably from place to place. Row crops generally need a complete fertilizer. A properly inoculated legume supplies a moderate amount of nitrogen to many crops in a rotation, especially if the legume is turned under. Additional nitrogen, however, is needed by corn, tobacco, and some other crops. Nitrogen fertilizer can be profitably used as a topdressing for small grains and a sidedressing for corn. Properly conserved manure is a good source of nitrogen, potassium, and organic matter, but it should be supplemented with phosphate fertilizer to obtain a balance of plant nutrients. Cover crops should follow row crops, and green-manure crops should be turned under as often as possible.

Even though these soils are somewhat likely to erode, runoff and erosion should not be a serious problem if the soils are managed well. All cultivation should be on the contour. Terracing and stripcropping may be desirable in places. Diversion ditches may be needed to protect Humphreys silt loam, gently sloping phase, against runoff from higher areas. All natural waterways should be planted to permanent sod. Supplementary irrigation may be desirable, but its practicability should be carefully considered.

The soils of this group are physically well suited to pasture, but the pasture is not productive without fertilization. Management for pasture consists chiefly in the supplying of needed amendments to suitable pasture plants. Lime and a complete fertilizer are needed to establish the pasture; potash and phosphate may be needed to maintain it. A topdressing of nitrogen is beneficial under a high level of management. Pasture consisting of orchardgrass or fescue and Ladino clover or white clover can be established and maintained with proper fertilization and other good management. The problem of weed control is not serious for pasture that receives adequate amendments and is properly grazed, but occasional mowing is necessary.

Capability unit IIe-4

Capability unit IIe-4 consists of moderately well drained fragipan soils of the uplands and stream terraces. The fragipan, or compacted layer, occurs at depths of 22 to 30 inches and restricts the movement of water and air and the growth of plant roots. These soils have a very friable or friable silt loam or loam surface soil. Their subsoil is yellowish-brown or light yellowish-brown friable or firm silt loam, or silty clay loam to clay loam. It is underlain by the mottled compacted layers.

The soils of capability unit IIe-4 are:

Captina silt loam, gently sloping phase.
Captina silt loam, eroded gently sloping phase.
Captina silt loam, level phase.
Dickson silt loam, gently sloping phase.
Dickson silt loam, eroded gently sloping phase.
Monongahela loam, gently sloping phase.
Monongahela loam, eroded gently sloping phase.
Monongahela loam, level phase.
Sango silt loam.

These soils are generally strongly to very strongly acid, moderate in moisture-supplying capacity, and low to moderate in organic matter. They are easily to very easily worked and conserved. The good tilth is easily maintained, and the soils are workable within a fairly wide range in moisture content. Because they warm slowly in spring, seedbed preparation and planting are often delayed. The fragipan restricts moisture, and the soils are somewhat droughty during extended dry periods. During very wet periods, tillage is frequently delayed.

Use and suitability.—The soils of this unit are used for crops and pasture, but a considerable acreage remains in forest. They are fair to good for crops and good to very good for pasture. Suitable crops grow moderately well on intensively cultivated areas. These soils are suited to nearly all of the commonly grown crops except alfalfa. Even in areas where fertility is made high, the yields of alfalfa are low and the stands are short lived because of the shallow depth to the pan and the restricted internal drainage. Corn, cotton, small grains, sericea lespedeza, soybeans, sorghum, lespedeza, crimson clover, vetch, orchardgrass, fescue, and white clover are successfully grown. Potatoes, tobacco, and red clover are grown with moderate success. The soils of this unit are better suited to small grains than to corn.

Management.—Short rotations that include a row crop once in 2 years are moderately well suited to the soils of this unit, but rotations in which a row crop is grown only once in 3 or 4 years are better. A suitable short rotation consists of a fall-seeded small grain that is overseeded in spring with lespedeza, and then a small grain is seeded again in fall. A longer rotation consists of corn followed by 2 years of a fall-seeded small grain that is overseeded each spring with lespedeza and then followed in fall by vetch or crimson clover that is turned under before corn is planted again. Cotton, sorghum, or some other row crop can be substituted for corn in this rotation. A longer rotation of a row crop and pasture or sericea lespedeza for 3 to 5 years is suitable and may be preferred by some farmers.

The soils of this unit need nitrogen, phosphate, potash, and lime, but they differ in the amounts needed. Lime generally should be applied liberally every 4 to 6 years or oftener. A complete fertilizer and lime are needed for most crops other than legumes. Legumes require liberal applications of phosphate, potash, and lime. A legume grown in a rotation supplies nitrogen to the crop that follows, particularly if the legume is plowed under. Commercial nitrogen, however, is normally required for sustained yields. It may be profitable to use nitrogen for topdressing small grain and for sidedressing corn. Barnyard manure is a good source of nitrogen, potassium, and organic matter. Turning under crop residues, green-manure crops, and old sod increases the organic matter and the moisture-holding capacity of the soils.

The soils of this unit are easily conserved by good management. Especially on the gentle slopes, cultivation should be on the contour. Natural waterways should remain in permanent sod. Stripcropping, terracing, or both, may be used if the fit the farming pattern. On the level phases in this unit, contour cultivation and stripcropping are not generally needed, but in some places diversion ditches may be needed to protect against the runoff from higher areas. In some areas it may be practical to use supplementary irrigation for cash crops and for pasture of high value; but before irrigation is used, its practicability should be carefully considered.

Adequate fertilization and liming are the main requirements of pasture management. If properly fertilized, a mixture of fescue or orchardgrass and Ladino clover or white clover can be grown. If the pasture is properly grazed and adequately fertilized, weed control is not a serious problem, but occasional mowing may be necessary. On heavily grazed areas the droppings should be scattered.

Capability unit IIw–1

Capability unit IIw–1 consists of somewhat poorly drained or moderately well drained soils of the first bottoms, local alluvial areas, or stream terraces. These soils are subject to flooding or to wash from adjacent slopes. They generally contain more lime, organic matter, and plant nutrients than the associated upland soils, but this content varies. Fresh sediments deposited by floodwaters or by slope wash aid in maintaining plant nutrients and organic matter. The relief of these soils is predominantly level. Whitwell loam, gently sloping phase, is the only soil in the unit that is more strongly sloping than 2 percent, and this soil slopes more than 3½ percent in only a few places.

The soils of capability unit IIw–1 are:

Dunning silty clay loam, drained phase.
Dunning silt loam, drained overwash phase.
Dunning silt loam, silty substratum phase.
Hamblen fine sandy loam.
Hamblen fine sandy loam, local alluvium phase.
Lindside silt loam, phosphatic phase.
Lindside silt loam, local alluvium phase.
Lindside cherty silt loam, phosphatic phase.
Lobelville silt loam.
Lobelville silt loam, local alluvium phase.
Taft silt loam, overwash phase.
Tyler loam, overwash phase.
Whitwell loam, gently sloping phase.
Whitwell loam, eroded gently sloping phase.
Whitwell loam, level phase.

As a group these soils are fairly easily to very easily worked and easily to very easily conserved. Some of them can be worked satisfactorily only within a narrow range of moisture content. Although Lindside cherty silt loam, phosphatic phase, contains a great deal of chert and gravel, the pieces are small and do not interfere materially with the use of farm machinery. Adequate supplies of moisture are generally available for plants, which are not injured by droughts so often as the plants on the adjacent upland soils.

Use and suitability.—Most areas of the soils of this unit are used for crops and pasture. These soils are well suited to corn, soybeans, lespedeza, grain sorghum, orchardgrass, meadow fescue, bermudagrass, alsike clover, and white clover. They are not well suited to alfalfa, potatoes, tobacco, and fruit trees. Only those soils that are less likely to be flooded—mainly Whitwell, Taft, and Tyler soils—are even moderately well suited to cotton. Because of lodging and winterkilling, the growing of small grains is risky. The more permeable, better drained areas are fairly well suited to many truck crops, especially late vegetables.

A systematic rotation is not ordinarily used on the soils of this group. The soils are used rather intensively for corn and occasionally for a hay crop. A considerable part is in pasture. These soils can be used for row crops every year or every other year, but a legume used for green manure is needed in many places to maintain organic matter and nitrogen. These soils are suited to a rotation of corn and hay or a rotation of soybeans grown for seed and alsike clover. Corn or soybeans can be replaced by sorghum in most rotations. Lespedeza, alsike clover, red clover, orchardgrass, fescue, Ladino clover, soybeans, millet, sudangrass, redtop, and white clover can be grown for hay or pasture. Because of the good moisture relations, these soils are well suited to pasture. Vetch is a good crop for winter cover and green manure.

Management.—Most of the soils of this unit need commercial fertilizers and lime. Without the use of fertilizer, yields are only fair to medium. Phosphate generally is needed for all crops except those grown on the phosphatic phases of the Lindside soils. A good stand of legumes needs additions of lime, phosphate, and potash. The nitrogen requirements for moderate yields of crops can be supplied by a legume in the rotation, especially if it is turned under. Commercial nitrogen, however, is usually needed for continued high yields. Barnyard manure supplies nitrogen and potassium and increases the humus content of the soils. The manure can be supplemented with phosphate fertilizer.

Even under good management, yields of the various crops vary from year to year because the amount and frequency of rainfall varies. Except on Dunning silty clay loam, drained phase, tilth is fairly easily maintained.

On the soils of this unit, tillage may be delayed in spring and during the rainy season. These soils can be cultivated only within a narrow range of moisture content. The seedbed, therefore, is often poorly prepared and tillage is poorly timed and inadequate. Row crops generally become very weedy in wet seasons.

Although these soils are not likely to erode, scouring by overflow and by runoff from adjacent slopes needs to be controlled in many small areas. In places where it is economically feasible, scouring may be prevented by building levees, digging diversion ditches, and improving channels. Whether or not it is feasible to drain the soils of this unit depends on many factors, including costs, the engineering characteristics of the soils, and the acreage of other soils available for use. Excess surface water may be easily controlled on many areas by W-type ditches and diversion ditches or by bedding and row direction. Many of the soils of this group are near streams, which may be suitable for supplementary irrigation. Irrigation would increase production of crops and pasture late in summer and early in fall.

Pasture can be improved by adequate fertilization and by growing suitable plants. Orchardgrass or fescue grown with whiteclover is suitable if a moderately high level of fertility is maintained. Lespedeza and redtop are suitable at low levels of fertility. Bermudagrass, alsike clover, sudangrass, and millet are other suitable pasture plants. Controlled grazing is particularly important during wet seasons because livestock trample the land and injure its physical properties. The management of pasture should include (1) regulated grazing, (2) the use of adequate fertilizer, (3) the mowing of weeds and excessive pasture growth, and (4) the scattering of the droppings on heavily grazed areas.

Capability unit IIs–1

The soils of capability unit IIs–1 have many chert fragments on the surface and throughout the profile. They occur on local alluvium and recent colluvium in level and gently sloping areas. All the soils are subject to wash from higher slopes. Those areas along large drainageways are likely to be flooded for short, infrequent periods. The Greendale soil is moderately well drained to well drained, and the Huntington soil is well drained. The Lindside and Lobelville soils are somewhat poorly drained to moderately well drained. All of these soils have cherty silt loam surface soils and, commonly, deep or very deep, permeable profiles.

Capability unit IIs–1 consists of the following soils:

Greendale cherty silt loam.
Huntington cherty silt loam, local alluvium phosphatic phase.
Lindside cherty silt loam, local alluvium phosphatic phase.
Lobelville cherty silt loam, local alluvium phase.

The reaction of these soils ranges from strongly acid to neutral. The soils contain a moderate to high amount of organic matter. Because of their chert content, these soils are generally only moderately easy to work, but they are very easy to conserve.

Use and suitability.—The soils of this unit are fairly well suited to most of the crops of the area. Their chertiness and droughtiness limit their suitability for use, especially their use for crops that mature late in summer or early in fall. These soils are very well suited to early vegetables. They are well suited to small grains, crimson clover, vetch, lespedeza, and red clover. Orchardgrass, fescue, white clover, and other common pasture plants do moderately well. Alfalfa grows moderately well to fairly well on the better drained soils, but it is poorly suited to the moderately well drained soils.

These soils are fair to good for pasture. They are used for pasture, chiefly because they occur in small areas in association with upland soils that are better suited to pasture than to crops. The pasture is generally very good early in the grazing season but becomes poor late in summer and early in fall.

Management.—Although these soils are suited to intensive use, crop rotation and fertilization are needed to maintain or increase yields. The rotation can be short but should include a legume. A suitable rotation consists of corn followed by vetch, or vetch and a small grain, that is turned under before corn is planted again. Another suitable rotation, which is commonly used, is corn followed in fall by a small grain that is overseeded in spring with lespedeza and reseeded in fall to a small grain that is used for winter pasture before corn is planted again. A rotation of small grain followed by annual lespedeza is well suited to these soils, but it is seldom used.

All the soils of the unit need moderate applications of nitrogen, potash, and lime. All except the phosphatic phases generally need small to moderate applications of phosphate. Although the cherty Huntington and Lindside soils are phosphatic, they do not contain so much phosphorus as the noncherty soils, and they should be more responsive to additions of phosphate. Properly inoculated legumes and legume-grass mixtures do not need applications of nitrogen but require potash and phosphate. Corn, small grains, grass, and other nonlegumes respond to nitrogen, but generally they do not need commercial nitrogen if a legume is used in a short rotation, especially if it is turned under. Most crops respond to potash. If it is applied in liberal quantities, barnyard manure is an excellent source of nitrogen, potash, and organic matter.

Because the soils of this group are not likely to erode, special tillage practices are not generally needed. Good tilth is easily maintained, and the soils can be worked within a wide range in moisture content. But workability can be improved by removing the larger chert fragments from the surface. In many places where overflow scours the soil seriously and runoff from higher areas deposits considerable chert, it may be necessary to construct levees or diversion ditches or to improve the channel along clogged drainageways. Some of the narrow areas subject to frequent scouring probably should remain in permanent sod, pasture, or hay.

Good management of pasture includes the use of amendments, proper grazing, mowing to remove excess herbage and to control weeds, and scattering droppings on heavily grazed areas.

Capability unit IIIe–1

Capability unit IIIe–1 consists of generally deep or very deep, well-drained soils of the uplands, stream terraces, and old colluvial slopes. They occur on gentle to moderate slopes. The surface soil of these soils ranges from medium to fine in texture. Their subsoil ranges from friable or firm to very firm silty clay loam or clay loam to firm clay. All the gently sloping soils in this unit are severely eroded, and all the sloping soils are either severely eroded or highly susceptible to severe erosion.

The soils of capability unit IIIe–1 are:

- Armour silt loam, eroded sloping phase.
- Cookeville silt loam, sloping phase.
- Cookeville silt loam, eroded sloping phase.
- Cookeville silty clay loam, severely eroded gently sloping phase.
- Cookeville silty clay loam, severely eroded sloping phase.
- Cumberland silt loam, eroded sloping phase.
- Cumberland silty clay loam, severely eroded gently sloping phase.
- Cumberland silty clay loam, severely eroded sloping phase.
- Decatur silty clay, severely eroded sloping phase.
- Etowah silt loam, eroded sloping phosphatic phase.
- Etowah silty clay loam, severely eroded sloping phase.
- Hermitage silt loam, eroded sloping phase.
- Sequatchie sandy clay loam, severely eroded sloping phase.
- Waynesboro loam, sloping phase.
- Waynesboro loam, eroded sloping phase.
- Waynesboro clay loam, severely eroded gently sloping phase.
- Waynesboro clay loam, severely eroded sloping phase.

These soils differ in their degree of fertility, content of organic matter, and water-holding capacity. The content of organic matter and plant nutrients depends to a large degree on the past cropping system and on the loss of soil material through erosion. These soils are more limited in their use suitability than those of capability unit IIe–1, chiefly because of their stronger slopes. The strong slopes cause more rapid runoff and more serious erosion.

Use and suitability.—Most of the soils of this group are used for a wide variety of crops and for pasture. They are well suited to corn, cotton, potatoes, tobacco, sorghum, soybeans, small grains, alfalfa, red clover, Ladino clover, sericea lespedeza, lespedeza, crimson clover, vetch, fescue, and orchardgrass.

These soils are well suited to pasture, but because of their less favorable moisture supply, they are not so productive as the soils of capability unit IIe–1.

Management.—Rotations used on these soils should not include a row crop more often than once in 3 years. Longer rotations, however, are desirable, especially on the more eroded areas. Close-growing crops should follow each clean-cultivated crop for 2 or 3 years. A winter cover crop should follow the row crop. Deep-rooted legumes and green-manure crops are beneficial. A rotation consisting of corn-small grain-alfalfa or orchardgrass and Ladino clover (3 to 5 years) is very well suited to the soils of this unit. The farmers who grow early potatoes generally use a rotation in which a green-manure crop of crimson clover is followed by potatoes and then the soil is seeded in fall to alfalfa, which remains for 3 or 4 years and is followed by corn. A rotation suitable for the severely eroded slopes is corn followed by rye and vetch, as a green-manure crop or a seed crop, followed by 3 to 6 years of sericea lespedeza. Some other suitable row crop can be substituted for the corn in this rotation.

The soils of this unit need moderate applications of lime, potash, and nitrogen. All except Armour silt loam, eroded sloping phase, and Etowah silt loam, eroded sloping phosphatic phase, need moderate applications of phosphate. All the soils of this unit respond well to adequate fertilization. Lime, phosphate, and potash are needed to establish and maintain high yields of legumes. Boron is needed for alfalfa, and nitrogen is needed for all crops except legumes. Yields of small grain are increased by a topdressing of nitrogen, and yields of corn by a sidedressing of nitrogen.

Although good tilth is moderately easy to maintain on most of these soils, tillage is rather difficult on the severely eroded soils unless their moisture content is just right. Soil structure, tilth, and moisture-holding capacity are improved by the growing of grasses, deep-rooted legumes, and green-manure crops and by the use of barnyard manure and crop residues.

Contour cultivation helps to control erosion and to conserve soil moisture. Areas used frequently for row crops should be terraced, if terraces can be properly constructed and maintained. Stripcropping may be more suitable than terracing on the steeper and more irregular slopes. On steep slopes terracing is impractical. All natural waterways should be seeded to permanent sod. Supplementary irrigation may be practical.

Pasture on these soils responds well to lime and phosphate. Additions of potash may be needed to maintain good pasture. Grasses and legumes seeded in fall are somewhat difficult to establish on the severely eroded soils, but heavy applications of barnyard manure aid in establishing and maintaining the stand. Nitrogen fertilizers are also beneficial in establishing pasture. After the pasture is established, the legumes in the pasture mixture should supply much of the nitrogen needed for high yields. If fertility is kept high, a mixture of orchardgrass or fescue and Ladino clover or white clover is well suited. At low levels of fertility, lespedeza and redtop are easier to establish and maintain. Other important management practices are controlled grazing and the control of undesirable plant growth by mowing.

Capability unit IIIe–2

Capability unit IIIe–2 consists mainly of cherty soils of uplands or old colluvial slopes that are well drained, moderately well drained, or somewhat excessively drained. These soils are on gentle to moderate slopes where erosion ranges from slight to severe. The gently sloping areas and part of the sloping areas are severely eroded. Those areas not severely eroded are subject to severe erosion if clean-cultivated crops are grown. Except for the Mountview soils, these soils are deep to very deep to bedrock.

The soils of capability unit IIIe–2 are:

- Baxter cherty silt loam, sloping phase.
- Baxter cherty silt loam, eroded sloping phase.
- Baxter cherty silty clay loam, severely eroded gently sloping phase.
- Bodine cherty silt loam, sloping phase.
- Hermitage cherty silt loam, eroded sloping phase.
- Mountview silt loam, sloping shallow phase.
- Mountview silt loam, eroded sloping shallow phase.
- Mountview silty clay loam, severely eroded gently sloping shallow phase.
- Pace cherty silt loam, eroded sloping phosphatic phase.
- Pace cherty silt loam, eroded sloping phase.

These soils are low in organic matter and moderate in water-supplying capacity. They are medium to very strongly acid. The chert fragments interfere with tillage and tend to accelerate the movement of water through the soil. These soils cannot be used so intensively as those of capability unit IIe–2, chiefly because of their steeper slopes, more rapid runoff, more severe erosion or risk of erosion, and droughtiness.

Use and suitability.—Most of the acreage in this unit is used for crops and pasture. Some remains in forest, and a small part is idle. These soils are fair to good for crops and for pasture. They are moderately well suited to most of the commonly grown crops, grasses, and legumes. These soils are better suited to early maturing crops and to the more drought-resistant crops than they are suited to the late-maturing crops. The early maturing crops include small grains, red clover, crimson clover, vetch, and early vegetables. The drought-resistant crops include cotton, sericea lespedeza, and sorghum. Corn, tobacco, and other late-maturing plants are likely to be injured during extended dry periods.

Management.—Under careful management cotton, corn, and similar row crops can be grown moderately well. Suitable rotations are those in which a row crop is grown once in 3 or 4 years and small grains, legumes, grasses, or other close-growing crops are grown the rest of the time.

An intensive rotation consists of corn followed by 2 years of fall-seeded small grain, which is overseeded with lespedeza each spring; then rye and vetch are seeded in fall and plowed under before corn is planted the following spring. A suitable longer rotation consists of corn followed by sericea lespedeza or a mixture of fescue and Ladino clover for 4 to 6 years; then corn is again planted. In these rotations any of the commonly grown crops can be substituted for corn. It may be desirable to use the soils for permanent pasture on farms that have sufficient acreage of soils better suited to row crops.

Generally, these soils need lime, nitrogen, phosphate, and potash. Pace cherty silt loam, eroded sloping phosphatic phase, needs less phosphate than the other soils of this unit. Most of the soils require heavy applications of lime, potash, and phosphate for good yields of legumes. Nitrogen is needed for moderate yields of all crops except possibly the legumes. Potash is generally needed for all crops, especially alfalfa, cotton, and tobacco. Applications of barnyard manure and turning under of crop residues and such green-manure crops as vetch or crimson clover aid in conserving soil moisture, improving tilth, and supplying nitrogen and organic matter.

Tillage is somewhat difficult because of the high chert content of the cherty soils, the shallow depth of the shallow phases, and the moderately fine texture of the severely eroded soils. Accumulations of chert may interfere with mowing in places. The workability of these soils can be improved if the larger loose stones are removed from the surface. Removing the stones, however, is generally practical only in small areas. The severely eroded soils cannot be tilled within so wide a range in moisture content as the less eroded soils.

Because the soils of this unit are likely to erode, they should be cultivated on the contour wherever possible. The more uniform and less strongly sloping areas should be terraced. On the steeper, more irregular slopes where terracing is impractical, stripcropping can be used to control runoff and erosion. All natural waterways ought to be kept in permanent sod. Diversion ditches or terraces may be needed in a few places to control runoff from higher slopes. Supplementary irrigation may be practicable for crops of high value, but the cost should be considered in relation to expected benefits.

Heavy applications of lime, phosphate, and potash are generally needed to establish and maintain good pasture. Nitrogen is needed in establishing pasture, but little nitrogen is required for maintaining the stand if a legume is grown in the mixture. If their fertility is kept high, these soils are suited to a mixture of orchardgrass or fescue and Ladino or white clover. Lespedeza and redtop or sericea lespedeza are suitable where the fertility level is low. Besides adequate fertilization and the use of suitable plants, management for pasture should include controlled grazing and the mowing of undesirable plants.

Capability unit IIIe–3

Capability unit IIIe–3 consists of well-drained soils of the uplands and stream terraces. They occupy moderate or gentle slopes. Four of the soils of this unit are severely eroded, and the rest are slightly eroded. The slightly eroded soils are subject to severe erosion if they are cultivated. The surface layer of these soils is predominantly light colored. Their subsoil is friable silt loam, silty clay loam to sandy clay loam, clay loam, or sandy clay. These soils are shallow to very deep to bedrock.

The soils of capability unit IIIe–3 are:

- Hartsells fine sandy loam, sloping phase.
- Holston loam, sloping phase.
- Holston loam, eroded sloping phase.
- Holston clay loam, severely eroded sloping phase.
- Mountview silt loam, sloping phase.
- Mountview silt loam, eroded sloping phase.
- Mountview silty clay loam, severely eroded gently sloping phase.
- Mountview silty clay loam, severely eroded sloping phase.
- Nolichucky clay loam, severely eroded sloping phase.

As a group, these soils are low to very low in organic matter, strongly to very strongly acid, permeable to water and air, and easily penetrated by plant roots. Although water is readily absorbed, it is not well retained. All the soils are more limited in use suitability than those of capability unit IIe–3, chiefly because of their stronger slopes, more severe erosion or greater risk of erosion, more rapid runoff, and greater tendency to droughtiness.

Use and suitability.—The soils of this unit are used for pasture and for a wide variety of crops. A considerable acreage remains in forest. Practically all of Hartsells fine sandy loam, sloping phase, is in forest because the soil is removed from farmed areas. The soils of this unit are better suited to cotton, sorghum, sericea lespedeza, and other drought-resistant crops than to small grains, crimson clover, vetch, potatoes, and other early maturing crops. These soils are fairly well suited to corn, tobacco, soybeans, alfalfa, and red clover. They are well suited to pasture.

Management.—For satisfactory yields the soils of this unit require good management, especially crop rotation, adequate fertilization, and effective erosion control. Rotations lasting 3 years or longer are suitable if grasses and legumes are kept on the soils about two-thirds of the time. Row crops should not be grown more than once in 3 or 4 years. A winter cover crop should follow each row crop, and green-manure crops should be grown and turned under as often as possible. If managed well, a suitable rotation consists of corn followed by 2 or 3 years of a fall-seeded small grain that is overseeded each spring with lespedeza; then a cover crop of vetch and rye are seeded to be plowed under before corn is planted the following spring. A rotation that is better suited for some farms is a row crop, followed by sericea lespedeza or a mixture of fescue and Ladino clover for 3 to 5 years, then another row crop. Alfalfa and red-clover stands are difficult to maintain, even though the crops are adequately fertilized and limed.

The amounts of plant nutrients and organic matter that these soils need vary considerably, mainly because of the past cropping system and loss of soil material through accelerated erosion. For high yields of most crops, all the soils need large amounts of nitrogen, phosphate, and lime. Most of them also need potash. Row crops generally require a complete fertilizer. Legumes require phosphate, potash, and lime. Grasses require complete fertilizers to become established, but they need little additional nitrogen if a properly inoculated legume is included in the mixture. A topdressing of nitrogen may help small grains. It may be profitable to sidedress corn and tobacco in seasons having adequate rainfall. Barnyard manure can furnish much of the needed nitrogen and potassium and will help replenish and maintain the organic matter.

Except for the severely eroded soils, the soils of this unit have good tilth that is easily maintained. Tilth of the severely eroded soils can be improved by liberal applications of manure, frequent use of green-manure crops, and the turning under of crop residues. These practices also improve the moisture-supplying capacity. An adequate supply of moisture is especially helpful to fall-seeded small grains, grasses, and legumes.

Water-control practices are required to maintain or increase yields. All cultivation should be on the contour. Stripcropping is desirable, particularly on the steeper and more irregular slopes where terracing is impractical. Both terracing and stripcropping help to control erosion and to conserve moisture in areas used frequently for clean-cultivated crops. Supplementary irrigation may be practical for high-value cash crops.

If properly fertilized, seeded, and otherwise well managed, these soils produce good pasture. For most permanent pasture plants, these soils are somewhat droughty late in summer and early in fall; therefore, supplementary pasture will generally be needed. Sudangrass, millet, lespedeza, and sericea lespedeza are well suited for use in supplementary pasture. Orchardgrass or fescue and Ladino or white clover pasture can be established and maintained if the level of fertility is kept high. Sericea lespedeza, lespedeza, or redtop can be grown at a low level of fertility. Only occasional mowing to control undesirable growth will be necessary on pasture that is properly grazed and adequately fertilized and limed.

Capability unit IIIe–4

Capability unit IIIe–4 consists of well drained or moderately well drained soils of uplands and colluvial slopes that are generally moderately deep to very deep. These soils have a friable to very firm surface soil and a friable to firm or very firm subsoil. They occur on gentle to moderate slopes, and all are eroded.

The soils of capability unit IIIe–4 are:

Mimosa silty clay loam, eroded sloping phase.
Mimosa silty clay loam, eroded gently sloping phase.
Mimosa cherty silt loam, eroded sloping phase.
Swaim silty clay loam, eroded gently sloping phase.

These soils are low to moderate in organic matter and medium to strongly acid in reaction. The silty clay or clay in the subsoil retards the movement of water and air and the penetration of roots. Mainly because of their shallow depth and lack of moisture during dry periods, these soils are not suitable for intensive use.

Use and suitability.—The soils of this group are used for crops and pasture. Nearly all areas have been cleared of the original hardwoods, and only a very small part is idle. The main crops are corn, cotton, soybeans, lespedeza, small grains, and alfalfa. These crops are grown with varying degrees of success. The soils are suited to a wide variety of pasture plants. A considerable acreage of the Mimosa soils is in pasture made up of bluegrass, lespedeza, and sedgegrass.

Management.—A systematic rotation is not normally used on most of these soils, especially on the Mimosa soils, which generally occur on farms that have little cropland.

Rotations in which a row crop is grown only once in 3 years are suitable. Longer rotations, however, are better for the sloping soils of this unit. An intensive rotation consists of corn followed by 2 years of a small grain overseeded with lespedeza each spring. A less intensive rotation consists of a small grain followed by 2 years of a mixture of red clover and orchardgrass. A longer rotation consisting of corn or small grain followed by alfalfa for 3 to 5 years is suitable for areas that are kept highly fertile. In this rotation, sericea lespedeza can replace alfalfa in areas where the fertility is low. In any rotation, early maturing or drought-resistant plants are better suited to the soils of this unit than corn or other crops that require an abundant moisture supply late in summer.

The soils of this unit generally need applications of lime, nitrogen, and potash. Because the Mimosa soils are moderate to high in phosphorus, crops do not respond well to phosphate fertilizer. The Swaim soil, however, is low in phosphorus, and crops do respond to phosphate. Lime, nitrogen, and potash are needed on the Mimosa soils for satisfactory yields of most crops and pasture plants. Complete fertilizer is needed on the Swaim soil.

Tillage is difficult on all of these soils. Except for Mimosa cherty silt loam, eroded sloping phase, the surface soil is moderately fine and the depth to the firm clay subsoil is shallow. On the Mimosa soil chert interferes with the use of farm machinery. None of these soils except the cherty Mimosa soil can be tilled within a wide range of moisture content without serious injury. Frequent use of barnyard manure or turning under green-manure crops and crop residues improves tilth, conserves soil moisture, and supplies organic matter and plant nutrients. All slopes should be cultivated on contour. Some areas should be terraced and stripcropped. All natural drains should be kept in permanent sod. Supplementary irrigation may be practical for cash crops of high value.

Under good management the soils of this unit produce a wide variety of pasture grasses and legumes. All the soils except the Swaim soil normally need lime, nitrogen, and potash if pasture is to be established. Pasture on the Swaim soil needs phosphate. On all the soils, potash and nitrogen are needed to maintain good pasture. Fescue or orchardgrass and Ladino clover are suitable pasture plants if the soils are kept at a high level of fertility. Lespedeza and native grasses or sericea lespedeza are suitable at a low level of fertility. The pastures should be properly grazed, and mowed to control undesirable plants.

Capability unit IIIw-1

Capability unit IIIw-1 consists of poorly drained or somewhat poorly drained soils of the uplands and stream terraces. These soils are mostly level, but some are level to gently sloping. Many of the areas are in depressions. The surface soil of these soils is friable or very friable silt loam or loam. The subsoil is mottled, friable or firm silt loam or silty clay loam to clay loam or sandy clay. At a depth of 18 inches or more is a compacted, slowly permeable fragipan. Many areas of these soils are likely to be flooded or ponded occasionally. A few areas are flooded or ponded frequently.

The soils of capability unit IIIw-1 are:

Guthrie silt loam, overwash phase.
Lawrence silt loam.
Purdy loam, overwash phase.
Robertsville silt loam, overwash phase.
Taft silt loam.
Tyler loam.

All of these soils are strongly to very strongly acid. Their water-supplying capacity is moderate. Moisture conditions are not favorable, and plants are injured both by excessive moisture and by droughts.

Use and suitability.—A large part of the acreage of this unit is in forest, particularly that part accounted for by Lawrence and Tyler soils. Much of the cleared acreage is used for pasture, and some is used for crops. A small part is idle. The smaller areas are generally used and managed along with the associated better drained soils. Some corn, cotton, and other annual crops are grown, but under natural drainage, yields are poor and complete crop failures are common.

A considerable acreage is used for soybeans, sorghum, and lespedeza. Under natural drainage, these crops are more suitable than corn, but yields are low unless the crops are fertilized. Attempts to grow alfalfa have failed. Small grains are grown with moderate success on those areas not subject to ponding and on areas where surface drainage is adequate. The use suitability of the soils of this unit can be broadened by artificial drainage. If they were adequately drained, these soils would be suited to about the same kinds of crops as the soils of capability unit IIe-4. These soils are fairly well suited to pasture, but they are too droughty to sustain good grazing through dry periods in summer and fall. Fescue is the best grass for these soils. Because the soils are wet, orchardgrass is not suitable.

Management.—Management of the soils of this unit requires the growing of crops that are suited to alternate wet and dry conditions, supplying needed amendments, and improving drainage. These soils can be conserved under rotations that include a row crop once in 3 years if other requirements are met. A rotation of corn followed by 2 years of lespedeza is suitable. Sorghum or soybeans can be substituted for corn in the rotation, and white or alsike clover for the lespedeza. A pasture mixture of fescue and Ladino clover is suitable in a longer rotation that includes a row crop. If the soils of this unit are carefully managed in all respects, row crops can be grown in alternate years.

These soils generally need applications of lime, nitrogen, phosphate, and potash. Corn, small grains, and sorghum need complete fertilizers. Legumes and legume-grass mixtures grown for hay or pasture need a complete fertilizer to establish the stand, but little or no nitrogen is needed for maintenance if the legume is properly inoculated. Most legumes need lime, and all crops in the rotation are benefited by its use.

Tillage may be delayed in spring and during rainy seasons because of unfavorable moisture conditions. Otherwise all cultivation can be easily carried out. None of these soils is susceptible to erosion.

Some attempt has been made to drain a number of areas with open ditches, but the results have been largely ineffective. Drainage, however, can be improved by properly constructed open and W-ditches, and proper row direction in areas having suitable outlets. Diversion ditches are needed in some places to control runoff from high slopes. Tiling is not effective in improving drainage of these soils, because of their impermeable pan layer.

Liming and complete fertilization are necessary for the establishment of good pasture. Supplementary irrigation to maintain pasture of a high carrying capacity under a high level of management may be practical.

A pasture mixture of fescue and Ladino or white clover is well suited to the soils that are kept highly fertile. A mixture of redtop and lespedeza can be used where the fertilization is light. Controlled grazing and periodic clipping to keep down weeds are necessary. Grazing when the soils are wet will injure the pasture and impair the physical properties of the soils.

Capability unit IIIw-2

Capability unit IIIw-2 consists of poorly drained soils of bottom lands. They generally are level, but some parts are slightly depressed. They have a very friable silt loam or very friable fine sandy loam surface soil and a very friable or friable underlying layer. These soils are wet much of the time, and a fluctuating water table remains near the surface in normal seasons. Nearly all areas are susceptible to flooding, and a few are subject to ponding. These soils are not likely to erode, but a few places have lost soil material through the scouring of floodwaters.

The soils of capability unit IIIw-2 are:

Lee silt loam.
Prader fine sandy loam.

These soils are moderate in organic matter, moderate to high in water-supplying capacity, and slightly acid to strongly acid. The high water table restricts air movement and plant-root development. Poor drainage and susceptibility to flooding or ponding greatly limit the use suitability of these soils.

Use and suitability.—A greater part of the acreage in this unit has been cleared of its original hardwoods forest. This acreage is used mostly for pasture and annual hay crops. Without artificial drainage, these soils are poorly suited to crops but are moderately well suited to pasture. If adequately drained, they probably would be suited to about the same kinds of crops as the soils of capability unit IIw–1. A small acreage in depressions has little or no value for pasture or crops.

In summer a high-yielding pasture can be grown on the drier parts of these soils from a mixture of fescue and white clover or Ladino clover. Other suitable pasture plants are lespedeza, redtop, and alsike clover.

These soils are well suited to a wide variety of water-tolerant hardwoods, but trees are seldom planted. The most suitable trees are white oak, hickory, white ash, beech, red maple, sweetgum, and blackgum.

Although these soils are poorly suited to tilled crops, sorghum and soybeans are grown with moderate success. Corn is grown with poor to fair results on the better drained sites. If sorghum or soybeans are planted late in spring or early in summer, only an occasional crop is lost because of excessive moisture. Lespedeza and soybeans are moderately suitable for summer hay crops.

Management.—If properly drained, these soils can be used rather intensively for row crops. Fertilizer should be applied to these soils in small, frequent applications. The Prader soil needs less fertilizer than the Lee soil, which is low in plant nutrients. Many areas of these soils receive plant nutrients when they are silted.

Tillage is delayed in rainy seasons, particularly in spring and summer, because of excessive moisture. Row crops are often weedy because of delayed tillage. Under good moisture conditions, however, the soils are easily worked and have good tilth.

Crops and pastures can be improved by artificial drainage. Open ditches, bedding, tiling, and channel improvement may be used where practical. The feasibility of drainage, however, depends on finding suitable outlets and on the cost of installation. Diversion ditches may be necessary to intercept runoff from adjacent slopes. The management of pasture includes the use of suitable plants, supplying needed amendments, proper grazing, mowing to control weeds and excessive herbage, and improving drainage where practical. Control of grazing is needed during wet seasons to prevent trampling animals from injuring the pasture and the tilth of the soils.

Little attention is given forest management, and no attempt is made to improve the forested tracts.

Capability unit IVe–1

Capability unit IVe–1 consists of well-drained to somewhat excessively drained soils of the uplands, stream terraces, and old colluvial slopes. Most of these soils are strongly sloping, but some are moderately sloping and severely eroded. The soils of this unit range from shallow to very deep.

The soils of capability unit IVe–1 are:

Baxter cherty silt loam, strongly sloping phase.
Baxter cherty silt loam, eroded strongly sloping phase.
Baxter cherty silty clay loam, severely eroded sloping phase.
Bodine cherty silt loam, strongly sloping phase.
Dellrose cherty silt loam, eroded strongly sloping phase.
Mountview silty clay loam, severely eroded sloping shallow phase.
Waynesboro loam, strongly sloping phase.

These soils are moderate to very low in organic matter and low to high in water-holding capacity. They range from medium acid to very strongly acid. They are permeable to water and air and are easily penetrated by plant roots. The Bodine soil differs from the other soils of this unit in being somewhat excessively drained.

Use and suitability.—Most of the soils of this group are used for crops and pasture. Some are used largely for forest. The soils of this group are poor to fair for crops and fair to good for pasture. Their use suitability is limited by the strong slopes, erosion and erosion hazard, droughtiness, and chert. These soils are suited to early maturing and drought-resistant crops, including small grains, crimson clover, vetch, lespedeza, sericea lespedeza, and red clover. Corn and cotton are grown. Corn yields are generally low, and cotton yields are fair to good. If fertility is kept high, alfalfa is fairly well suited to all except the Bodine soil. Nearly all of the commonly grown hay and plasture plants can be grown. These soils are suited to all of the upland hardwoods common to the county. They are well suited to pine.

Management needs.—If these soils are used for intertilled crops, they need stringent management, including rotations that last 5 years or longer. A rotation of corn or cotton, orchardgrass, and Ladino clover for 4 to 6 years is suitable. A rotation made up of a small grain followed by lespedeza and fescue or by orchardgrass and white clover or Ladino clover is more suitable and better protection against erosion.

These soils need additions of lime, potash, and nitrogen, and all except the Dellrose soil need phosphate. Lime, phosphate, and potash are essential for the successful growth of alfalfa, red clover, and most other legumes. Except possibly on the Dellrose soil, nearly all crops of the area respond well to a phosphate fertilizer. Nitrogen is needed for high yields of all crops except the legumes. Legumes, cotton, and other crops need additions of potash. A complete fertilizer is needed to establish pasture, and generally phosphate and potash should be applied for maintenance. The frequent application of barnyard manure and the turning under of green-manure crops and crop residues improve tilth and water-holding capacity and increase the organic matter and plant nutrients.

The use of farm machinery is somewhat difficult because of the chert or strong slopes, or both. Tilth is poor, and on the severely eroded areas moisture conditions are unfavorable for seeding fall crops such as small grains, grasses, and legumes. Mulching these areas will greatly aid germination, check runoff, and conserve moisture, and help produce full stands.

All cultivation and seeding should be done on the contour. Row crops or small grains should be stripcropped on contour, especially on the longer slopes. It may be desirable to establish permanent pasture in alternate strips when reseeding old sod. Terraces are not generally needed, because most slopes are too steep. All waterways should remain in sod. These soils should not be difficult to conserve if kept in close-growing plants and otherwise managed well.

With proper fertilization a pasture mixture of orchardgrass or fescue and white clover or Ladino clover is well suited. Although mowing is difficult in most areas, controlled grazing and mowing are needed to keep down weeds.

Almost all of the uneroded or slightly eroded soils are in hardwoods forest of poor quality. Forest management should include selective cutting, thinning, interplanting, and protection from fires.

Capability unit IVe-2

Capability unit IVe–2 consists of well drained or moderately well drained soils of uplands and old colluvial slopes and benches. They are sloping and strongly sloping. The sloping areas are severely eroded, and the strongly sloping areas are moderately eroded.

The soils of capability unit IVe–2 are:

Mimosa silty clay, severely eroded sloping phase.
Mimosa cherty silt loam, eroded strongly sloping phase.
Mimosa cherty silty clay loam, severely eroded sloping phase.
Swaim silty clay, severely eroded sloping phase.

These soils are very low to moderate in organic matter and medium acid to strongly acid. Water and air movement is slow, and the firm or very firm subsoil makes the penetration of roots fairly difficult. Because water is absorbed slowly by the subsoil, runoff is generally rapid to very rapid and accelerated erosion is likely. A few of these soils contain chert that interferes considerably with the use of farm machinery.

The soils of this group are used mainly for pasture. A considerable part is used for crops, and a small acreage is idle. Corn, hay, and small grains are the main crops.

The use suitability of these soils is limited by strong slopes, erosion or risk of erosion, poor tilth, and droughtiness. The soils are poorly suited to corn, cotton, and tobacco. They are somewhat better suited to small grains and to alfalfa, red clover, lespedeza, sericea lespedeza, and other hay crops. These soils are better suited to permanent pasture and to hay than they are to row crops or small grains. They are suited to many pasture plants, including bluegrass, orchardgrass, fescue, Ladino clover, white clover, and red clover. Pines and yellow or black locust grow well, and most of the trees common to the upland of the county can be grown.

Management.—If these soils are needed for row crops, a rotation lasting 5 to 6 years should be used. After the harvest of row crops, grasses and legumes or other cover crops should be planted. These close-growing plants should remain on the soils most of the time. Mainly because the irregular slopes and occasional gullies hamper the use of combines, and because moisture conditions are unfavorable for fall seeding, these soils are little used for small grains.

The amounts of amendments that these soils need vary. The needs depend chiefly on the past cropping system and the degree of erosion. Lime, nitrogen, and potash are needed on the Mimosa soils for most crops and for establishing and maintaining pasture. A complete fertilizer is generally needed for satisfactory yields of most crops and pasture on the Swaim soil.

Tillage is difficult because of the moderately fine or fine texture of the surface soil, the shallow depth to the very firm subsoil, or the high chert content. As a group, the soils have poor tilth, which is difficult to maintain or improve. Tillage can be performed within a narrow range in moisture content on all the soils except Mimosa cherty silt loam, eroded strongly sloping phase, without serious impairment of their physical properties. In many places, the operation of farm machinery is hindered by the cherty surface, the irregular slopes, and the few gullies. Late spring and late fall seedings are often difficult to establish because of the unfavorable moisture relations of the soils. The frequent use of barnyard manure, green-manure crops, and crop residues conserves soil moisture, improves tilth and soil structure, and supplies organic matter and plant nutrients.

All cultivated crops should be grown on the contour. On the longer and steeper slopes, old sods can be improved, and further erosion controlled, by establishing pasture and growing permanent hay crops in strips. Stripcropping can be used on the longer and more uniform slopes. Terraces may be used on some areas that are not too steep for their proper construction and maintenance. All waterways should be planted to permanent sod.

Pasture is normally difficult to establish, especially on the severely eroded areas. Good pastures, however, can be established by good management that includes adequate seedbed preparation and proper fertilization. Mulching and heavy applications of manure may be needed. Grazing and undesirable plants should be controlled.

Areas of these soils that are not needed for pasture or crops should be planted to trees.

Capability unit IVw-1

Capability unit IVw–1 consists of poorly drained grayish soils of the uplands and stream terraces. These soils generally occupy flats, and many areas are in depressions. During the wet seasons they are waterlogged or ponded, but during the driest parts of the year most of them are excessively dry. The surface soil is friable silt loam or very friable loam. The subsoil is mottled friable to firm or compact silty clay loam or clay loam to silty clay or sandy clay.

The soils of capability unit IVw–1 are:

Guthrie silt loam.
Purdy loam.
Robertsville silt loam.

These soils are strongly acid to very strongly acid. They have a moderate capacity for retaining available plant nutrients.

Use and suitability.—A very large part of the acreage remains in forest. Most of the large cleared areas are used for pasture. A small part, however, is idle and grown over with reeds, sedges, and water-tolerant bushes. Many smaller areas are farmed with the associated better drained soils.

The use suitability of these soils is greatly limited, chiefly by the widely fluctuating moisture, the low or very low fertility, and the acidity. The soils are very poorly suited to corn, cotton, red clover, and alfalfa. Failures of the most water-tolerant crops are common. These soils are better suited to forest, pasture, and summer annual hay crops. The better drained areas are fairly well suited to sorghum, soybeans, and lespedeza. Fescue, Ladino clover, lespedeza, bermudagrass, and redtop are suitable for pasture, and lespedeza and soybeans make good hay crops. Yields are generally low unless the plants are fertilized and adequate surface drainage is provided.

Management.—The management of these soils includes the selection of plants that are best suited to extreme wet and dry conditions, supplying needed amendments, and improving drainage. Some areas have been drained by open ditches, but attempts to drain these soils have been largely ineffective. Where suitable outlets are available, drainage by properly constructed open ditches and bedding would increase yields and broaden the use suitability of the soils. The cost of drainage, however, should be carefully estimated. If these soils were drained, they would be suited to about the same crops as the soils of capability unit IIIw–1. Tile is not effective in removing excess water, because of the compact layers in these soils. Supplementary irrigation may be practical on pasture late in summer and early in fall if other management requirements are met.

These soils are deficient in nitrogen, phosphorus, potassium, and lime. Whether or not these soils should be used and fertilized may be determined by past experiences and by the degree of their surface drainage. Nearly all of the better suited crops and pasture plants except legumes need a complete fertilizer, and all will be benefited by lime.

The soils are easy to work, but good tilth is somewhat difficult to maintain in many areas because the plow layer is either very wet or very dry much of the time. Tillage is delayed in spring, early in summer, and during rainy seasons because of unfavorable moisture conditions. Erosion is not a problem, because the soils are level.

If the soils are adequately limed and fertilized, a mixture of fescue and white or Ladino clover is apparently the best combination for pasture. Lespedeza, redtop, and bermudagrass can be grown at a low level of fertility. Complete fertilization is needed to establish good pasture, and possibly phosphate and potash are needed to maintain it. Little additional nitrogen will be required to maintain the pasture if a properly inoculated legume is in the pasture mixture. Mowing is necessary to control weeds and excess herbage. Livestock should be grazed in rotation. They should not be allowed to graze when the soils are very wet, because their trampling will injure the pasture plants.

Before forested areas are cleared for crops and pasture, careful consideration should be given to the cost of clearing, intended use, local drainage, and need for additional cleared land. In many places the cost of clearing would greatly exceed the increased value of the land. The forest probably should remain because the soils are fairly productive of white oak, hickory, sweetgum, blackgum, maple, and other water-tolerant trees.

Capability unit IVs–1

Capability unit IVs–1 consists of the following deep to very deep sandy or loamy soils on level to gently sloping first bottoms or low stream terraces:

Bruno loamy fine sand.
Sequatchie cobbly fine sandy loam, gently sloping phase.

These soils are strongly to slightly acid, low to moderate in organic matter, and low in available moisture. They have very rapid to medium internal drainage and loose or very friable consistence. The Bruno soil is very easily worked and maintained in good tilth. It can be worked over a very wide range in moisture conditions, but its very sandy texture and loose consistence interfere somewhat with the use of heavy machinery. This soil is moderately difficult to conserve, however, because practically all areas are adjacent to large streams and are subject to scouring by floodwaters. The cobbly Sequatchie soil is easily conserved, but the cobblestones on the surface and throughout the profile are numerous enough to interfere with the use of farm machinery.

Use and suitability.—The soils of this unit are used for crops or pasture. The Bruno soil is moderately well suited to intensive use for melons and such early truck crops as potatoes, beans, tomatoes, and cabbage, but heavy fertilization with nitrogen, potash, and phosphate is required. Even under good management general farm crops such as corn, red clover, small grains, and lespedeza do only fair on this soil. Because the cobbly surface makes the use of mechanized tools almost impossible, the Sequatchie soil is suited mainly to pasture. Its suitability could be broadened by removing the larger cobbles from the surface. Both soils are suited to permanent pasture. Suitable pasture plants are orchardgrass, fescue, sericea lespedeza, lespedeza, and whiteclover. These soils are also suited to all the trees commonly grown on the well-drained soils of the bottom lands and uplands of the county.

Management.—The soils of this group require frequent application of a complete fertilizer and lime to provide fair yields of crops and pasture plants. Even then, success in producing fair yields depends upon adequate rainfall, unless the soils are irrigated. The Bruno soil receives some organic matter and plant nutrients from silting, but because of its low capacity to retain nutrients, it is benefited very little by these materials.

Even under good management, the carrying capacity of pasture is not high. Weeds and bushes are difficult to control on the cobbly Sequatchie soil. The irrigation of these soils would not increase the carrying capacity of the pasture enough to justify the added expense.

Capability unit VIe–1

Capability unit VIe–1 consists of severely eroded soils that occur mainly on strong slopes. A very small moderately sloping acreage is eroded to the extent that gullies cover a considerable part of the surface. Depth to bedrock ranges from shallow to very deep. The surface soil or plow layers and the subsoil are friable to very firm. A few of the soils have rock outcrops.

The soils of capability unit VIe–1 are:

Baxter cherty silty clay loam, severely eroded strongly sloping phase.
Cookeville silty clay loam, severely eroded strongly sloping phase.
Cookeville silty clay loam, gullied sloping phase.
Dellrose cherty silty clay loam, severely eroded strongly sloping phase.
Mimosa cherty silty clay loam, severely eroded strongly sloping phase.
Mimosa, Baxter, and Colbert very rocky soils, strongly sloping phases.
Talbott cherty silty clay loam, severely eroded strongly sloping phase.
Waynesboro clay loam, severely eroded strongly sloping phase.

These soils are generally low or very low in organic matter. The very rocky soils, however, commonly contain more organic matter than the others because less of their area has been cropped and severely eroded. The soils of this unit have rapid to very rapid runoff and very low to high water-supplying capacity. They are medium acid to strongly acid. On many of these soils the chert interferes with the operation of farm machinery.

Use and suitability.—Except for parts of the very rocky soils, all the soils of this unit have been cleared and used for crops and pasture. Most of the soils are now in pasture, generally unimproved. Part is used for crops, chiefly along with associated less eroded soils. Many small areas are idle and sparsely vegetated.

Chiefly because of the moderately fine textured or fine textured surface soil, strong slopes, stoniness, or droughtiness, these soils are suitable only for pasture and forest. Most of the commonly grown grasses and legumes can be grown, including orchardgrass, fescue, bermudagrass, sericea lespedeza, whiteclover, and kudzu. Apparently many of these soils were used for crops until low yields and severe erosion made cultivation impractical.

Management.—For satisfactory yields all the soils of this unit need lime, nitrogen, and potash. All except the Dellrose and Mimosa soils need phosphate. Suitable plants respond to proper fertilization if an ample moisture supply is available.

These soils must be worked carefully, even under good moisture conditions. When dry, the soils are difficult to till and break into clods or lumps that are hard to pulverize. If tilled when too moist, the soils form hard clods upon drying. The high chert content, the rock outcrops, and the few gullies hamper the use of farm machinery. Seedbeds are difficult to prepare. A good sod is difficult to establish on the more severely eroded areas without special treatment, including heavy seeding, liberal use of barnyard manure, and use of a light mulch.

These soils should be plowed or disked only for reseeding pasture. All tillage should be done on the contour. Seeding by drills should also be on the contour. After the seedbed is prepared, erosion is a great hazard until the pasture plants become well established. On the longer slopes permanent pasture should be in alternate strips to protect against further erosion. All waterways should remain in sod. Terraces are not practical on these soils.

Good stands of suitable pasture plants are difficult to establish and maintain. They require the use of liberal amounts of lime, fertilizer, and manure and other good management. Grazing should be controlled. Mowing is necessary for the control of weeds and other undesirable growth. Mowing, however, is difficult in many areas.

After these soils have been improved for several years by good pasture management, selected areas may be used for suitable small grains or annual hay. To prepare the soils for this use, they should be kept highly fertile and in deep-rooted legumes or other permanent sod, and the organic matter and water-holding capacity of the soils should be increased.

The areas of the soils of this unit that are not needed for grazing should be planted to suitable trees. Pine trees generally grow best. On selected sites—particularly on the Dellrose and Mimosa soils—poplar, black or yellow locust, walnut and other hardwoods can be grown. The very few existing woods and new plantings should be protected from fire and grazing. The older timber stands should be selectively cut.

Capability unit VIe–2

The soils of capability unit VIe–2 are moderately steep or steep. The surface soil is very friable or friable cherty silt loam or friable to firm cherty silty clay loam. The subsoil is very cherty or cherty friable silt loam to silty clay loam. Because they are open and porous and steep, the soils are droughty.

Capability unit VIe–2 consists of the following soils:

Bodine cherty silt loam, moderately steep phase.
Dellrose cherty silt loam, moderately steep phase.
Dellrose cherty silt loam, steep phase.
Dellrose cherty silty clay loam, severely eroded moderately steep phase.

The Bodine soil is low in lime and organic matter. The Dellrose soils are also low in lime, but they contain somewhat more organic matter than the Bodine soil.

Use and suitability.—The soils of this unit are used largely for forest and pasture. All the soils are well suited to forest; probably it is better to limit the Bodine soil to forestry than the others. In most places the timber is mainly oak and hickory of low quality.

The cleared areas are used chiefly for unimproved pasture, though a small acreage is used for crops. Because of the high chert content, steepness, poor tilth, and erosion, the use suitability of these soils is limited. Yields of crops and pasture are low.

Management.—The Bodine soil needs lime, nitrogen, potash, and phosphate. The Dellrose soils need all these amendments except phosphate. These amendments should be supplied in places where it is feasible.

Because these soils are steep and high in chert, preparing seedbeds, applying amendments, mowing, and other farm operations are difficult. All soils should be tilled on the contour. Pasture should be established in contour strips, especially on the longer slopes.

On most farms the soils of capability unit VIe–2 probably can be used and managed best in pasture. Amendments are seldom used for pasture, and few attempts are made to control grazing and to keep down weeds. Lime, potash, and possibly phosphate are needed to establish and maintain good pasture. Nitrogen may also be needed to establish the pasture, and lime and fertilizer are needed to increase carrying capacity and to help control sedgegrass. Fescue, orchardgrass, Ladino clover, white clover, and red clover can be grown under a high level of fertility; sericea lespedeza or lespedeza, at a lower level of fertility.

The pasture plants used on much of the Dellrose soils—bluegrass, lespedeza, and sedgegrass—furnish good grazing in spring and early in summer if they are properly grazed and if weeds and other undesirable plants are controlled. Mowing is difficult, however, because of the steep slopes and large chert fragments.

On some farms the soils of this unit can be used best for timber, particularly those soils already in timber. The poor stands of timber could be improved if they were protected against overgrazing, burning, and overcutting. Although all of the upland hardwoods common to the county are grown, poplar, walnut, black locust, and yellow locust are well suited to the Dellrose soils. Oak, hickory, and pine are probably best suited to the Bodine soil. The trees should be protected against grazing and fires and should receive other good forest management.

Capability unit VIIs–1

The soils and miscellaneous land types in capability unit VIIs–1 are steep, shallow, severely eroded, infertile, droughty, are extremely stony, or they have a combination of these characteristics. They are:

Bodine cherty silt loam, steep phase.
Bouldery colluvial land, strongly sloping phase.
Gravelly alluvial land.
Gullied land.
Made land.
Mimosa, Baxter, and Colbert very rocky soils, moderately steep phases.
Muskingum stony fine sandy loam, strongly sloping phase.
Rockland, moderately steep.
Rockland, sloping.
Rock outcrop.

Use and suitability.—A considerable part of this unit is in forest. The soils and land types are not suited to pasture; but because of a shortage of better soils, some selected areas may be used for pasture. The members of this unit should be used for forest, although they differ in their capacity to grow trees.

Management.—If areas of the soils and land types of this unit are used for pasture, special management will be needed. Amendments must be used, pasture plants carefully selected, and grazing controlled. Where possible, pasture should be established in contour strips, rather than by plowing the entire slope at one time. Fescue, sericea lespedeza, bermudagrass, lespedeza, and similar plants can be grown in some areas. On the deeper soils, orchardgrass and whiteclover can be grown. Yields, however, are generally low, and the pasture is difficult to maintain or establish. The control of weeds and other undesirable plants by mowing is very difficult.

Reforestation generally should be carried out on the parts of this capability unit not in forest. In places a suitable forest cover will establish itself if trees are properly protected from fire and grazing. In other places planting is necessary. Because there is not enough soil depth to support trees, rock outcrop and parts of Rockland are very poorly suited to forest. Shortleaf pine is suitable for planting on the more exposed or less favorable growing sites. On better sites, where moisture relations are more favorable to plant growth, black locust, yellow-poplar, walnut, and other deciduous trees may be desirable. Forest management should include (1) maintaining a full stand of desirable species; (2) systematic cutting and weeding of trees; (3) harvesting mature trees so that desirable species may succeed them; and (4) controlling fires, browsing, trampling, and damage from other causes.

Estimated Yields

The estimated average acre yields of principal crops on the soils of Coffee County are given in table 1 under two levels of management. In columns A are yields to be expected under the prevailing, or common, management. Prevailing management is not the same on all soils, or on the same kind of soil in different parts of the area or on different farms. The yields given, however, are believed to represent those that would result under management currently practiced on the different soils.

The yields in columns A are based largely on observations made by the soil survey party, on interviews with farmers and other agricultural workers of the area, and on the records of a small number of test demonstrations. Also, comparisons with yield tables for similar soils in other counties of Tennessee were made. Specific data on crop yields are not generally available for soil types and phases, but the summation of local experience gives fairly reliable estimates. For some crops and for pasture, yield information of any kind is scarce.

TABLE 1.—*Expected average acre yields of principal crops under two levels of management*

[Average yields in columns A are to be expected under common management; yields in columns B are to be expected under good management. Dashed lines indicate crop is not generally grown at the management level indicated or that soil is unsuited to its production]

Soil	Corn		Cotton		Wheat		Oats		Lespedeza hay		Alfalfa hay		Potatoes		Pasture		Capability unit
	A	B	A	B	A	B	A	B	A	B	A	B	A	B	A	B	
	Bu.	*Bu.*	*Lb.*	*Lb.*	*Bu.*	*Bu.*	*Bu.*	*Bu.*	*Tons*	*Tons*	*Tons*	*Tons*	*Bu.*	*Bu.*	*Cow-acre-days* [1]	*Cow-acre-days* [1]	
Armour silt loam:																	
Eroded gently sloping phase	38	68	----	525	20	30	33	58	1. 2	1. 8	3. 0	3. 9	----	185	85	140	IIe-1
Eroded sloping phase	32	55	----	450	15	25	28	50	. 9	1. 6	2. 8	3. 6	----	165	75	130	IIIe-1
Baxter cherty silt loam:																	
Sloping phase	22	38	250	325	12	20	22	38	. 7	1. 2	1. 7	2. 6	80	115	75	110	IIIe-2
Eroded sloping phase	20	35	230	300	11	18	20	35	. 6	1. 2	1. 7	2. 4	75	110	70	105	IIIe-2
Gently sloping phase	24	42	250	400	14	20	22	40	. 7	1. 4	2. 0	2. 8	90	125	80	115	IIe-2
Strongly sloping phase	----	28	----	300	----	14	----	30	----	1. 1	----	2. 2	----	----	----	90	IVe-1
Eroded strongly sloping phase	18	26	175	250	9	13	15	26	. 5	1. 0	----	2. 0	----	----	60	85	IVe-1
Baxter cherty silty clay loam:																	
Severely eroded sloping phase	15	22	150	225	8	12	14	22	. 4	. 8	1. 2	1. 8	----	----	30	70	IVe-1
Severely eroded gently sloping phase	18	30	175	250	10	15	16	28	. 5	1. 0	1. 6	2. 2	----	----	45	75	IIIe-2
Severely eroded strongly sloping phase	----	----	----	----	----	----	----	----	----	. 5	----	----	----	----	25	60	VIe-1
Bodine cherty silt loam:																	
Moderately steep phase	----	----	----	----	----	----	----	----	----	----	----	----	----	----	35	55	VIe-2
Sloping phase	18	25	190	250	9	13	15	22	. 3	. 6	----	----	----	----	45	65	IIIe-2
Strongly sloping phase	15	22	----	----	----	12	----	20	. 3	. 5	----	----	----	----	40	60	IVe-1
Steep phase	----	----	----	----	----	----	----	----	----	----	----	----	----	----	35	50	VIIs-1
Bouldery colluvial land, strongly sloping phase	----	----	----	----	----	----	----	----	----	----	----	----	----	----	20	50	VIIs-1

See footnote at end of table.

TABLE 1.—*Expected average acre yields of principal crops under two levels of management*—Continued

Soil	Corn		Cotton		Wheat		Oats		Lespedeza hay		Alfalfa hay		Potatoes		Pasture		Capability unit
	A	B	A	B	A	B	A	B	A	B	A	B	A	B	A	B	
	Bu.	*Bu.*	*Lb.*	*Lb.*	*Bu.*	*Bu.*	*Bu.*	*Bu.*	*Tons*	*Tons*	*Tons*	*Tons*	*Bu.*	*Bu.*	*Cow-acre-days* [1]	*Cow-acre-days* [1]	
Bruno loamy fine sand	15	30							. 4	. 8					45	75	IVs-1
Captina silt loam:																	
Gently sloping phase	30	45	275	400	13	20	24	42	. 8	1. 3				125	70	115	IIe-4
Eroded gently sloping phase	28	42	275	400	12	19	22	40	. 7	1. 3				120	65	110	IIe-4
Level phase	32	48	275	400	12	20	22	40	. 8	1. 4				120	75	120	IIe-4
Cookeville silt loam:																	
Gently sloping phase	33	60	330	500	19	26	32	55	1. 1	1. 7	2. 6	3. 5	150	180	80	135	IIe-1
Eroded gently sloping phase	30	55	300	450	18	25	30	50	1. 0	1. 6	2. 5	3. 2	140	170	80	130	IIe-1
Sloping phase	28	50	300	450	15	22	26	48	. 9	1. 5	2. 4	3. 1	135	160	75	130	IIIe-1
Eroded sloping phase	25	48	275	425	13	20	24	45	. 8	1. 4	2. 3	3. 0	125	150	70	120	IIIe-1
Cookeville silty clay loam:																	
Severely eroded gently sloping phase	20	38	250	375	12	18	20	36	. 6	1. 2	2. 0	2. 6			55	95	IIIe-1
Severely eroded sloping phase	18	35	225	325	10	16	18	34	. 5	1. 1	1. 8	2. 4			50	85	IIIe-1
Severely eroded strongly sloping phase						12		20	. 4	. 9		1. 6			40	75	VIe-1
Gullied sloping phase															25	60	VIe-1
Cumberland silt loam:																	
Eroded gently sloping phase	38	65	350	500	20	30	32	56	1. 1	1. 7	3. 0	3. 8	160	190	85	140	IIe-1
Gently sloping phase	40	68	375	525	22	32	33	58	1. 2	1. 8	3. 0	3. 8	165	195	90	145	IIe-1
Eroded sloping phase	30	55	300	475	17	25	28	50	1. 0	1. 6	2. 6	3. 6	135	165	75	125	IIIe-1
Cumberland silty clay loam:																	
Severely eroded gently sloping phase	24	42	250	400	15	22	24	42	. 8	1. 3	2. 0	3. 0	110	140	60	115	IIIe-1
Severely eroded sloping phase	20	38	225	335	11	18	22	36	. 5	1. 1	1. 9	2. 5			50	95	IIIe-1
Decatur silty clay loam, eroded gently sloping phase.	35	62	350	500	20	28	32	55	1. 1	1. 7	3. 0	3. 7	150	180	85	140	IIe-1
Decatur silty clay, severely eroded sloping phase	18	35	200	300	10	16	16	32	. 5	1. 0	1. 8	2. 4			50	95	IIIe-1
Dellrose cherty silt loam:																	
Moderately steep phase	20	35													65	95	VIe-2
Eroded strongly sloping phase	25	40			10	16	20	35	. 6	1. 1		2. 3			70	100	IVe-1
Steep phase															60	80	VIe-2
Dellrose cherty silty clay loam:																	
Severely eroded moderately steep phase															50	70	VIe-2
Severely eroded strongly sloping phase	18	32				12		30	. 4	. 8		2. 0			55	90	VIe-1
Dickson silt loam:																	
Gently sloping phase	28	42	250	400	11	18	21	40	. 7	1. 3				100	60	110	IIe-4
Eroded gently sloping phase	25	40	225	375	10	16	20	38	. 6	1. 2				95	55	105	IIe-4
Dunning silty clay loam, drained phase	32	48							1. 1	1. 5					90	110	IIw-1
Dunning silt loam:																	
Drained overwash phase	40	55							1. 3	1. 9					100	140	IIw-1
Silty substratum phase	35	50							1. 2	1. 6					95	115	IIw-1
Emory silt loam	45	65	400	450	20	28	38	52	1. 4	1. 8	2. 4	3. 4	140	180	105	140	I-1
Etowah silt loam:																	
Eroded gently sloping phase	35	60	400	500	20	30	32	55	1. 1	1. 7	2. 8	3. 6	160	185	85	140	IIe-1
Eroded gently sloping phosphatic phase	35	60		500	20	30	32	55	1. 2	1. 8	3. 0	3. 8		185	85	140	IIe-1
Eroded sloping phosphatic phase	30	52		450	15	25	28	50	. 9	1. 5	2. 8	3. 5		160	70	120	IIIe-1
Etowah silty clay loam, severely eroded sloping phase	16	35	200	300	9	15	15	30	. 5	1. 0	1. 8	2. 4			50	90	IIIe-1
Gravelly alluvial land																	VIIs-1
Greendale silt loam	40	55	325	425	12	24	24	45	1. 2	1. 6	1. 8	2. 8	120	150	85	125	I-1
Greendale cherty silt loam	22	32	225	350	10	16	15	30	. 9	1. 1		2. 2	65	100	70	100	IIs-1
Gullied land																	VIIs-1
Guthrie silt loam		25							. 3	. 8					30	65	IVw-1
Overwash phase	18	30							. 4	1. 0					45	80	IIIw-1
Hamblen fine sandy loam	40	55							1. 2	1. 6					100	135	IIw-1
Local alluvium phase	35	50							1. 0	1. 4					95	130	IIw-1
Hartsells fine sandy loam:																	
Gently sloping phase	22	45	225	400	10	16	16	35	. 8	1. 4		2. 8	100	160	55	120	IIe-3
Sloping phase	18	40	200	375	9	14	15	30	. 7	1. 2		2. 5	90	140	50	105	IIIe-3
Hermitage silt loam:																	
Eroded gently sloping phase	32	55	350	475	18	26	30	55	1. 0	1. 6	2. 7	3. 5	140	175	80	130	IIe-1
Gently sloping phase	35	62	400	500	20	28	32	56	1. 1	1. 8	2. 8	3. 7	145	185	85	140	IIe-1
Eroded sloping phase	28	50	300	450	14	22	25	45	. 8	1. 4	2. 5	3. 4	135	165	70	125	IIIe-1
Hermitage cherty silt loam, eroded sloping phase	22	42	250	375	14	22	22	40	. 7	1. 3	2. 0	3. 0	90	130	75	115	IIIe-2

See footnote at end of table.

TABLE 1.—*Expected average acre yields of principal crops under two levels of management*—Continued

Soil	Corn		Cotton		Wheat		Oats		Lespedeza hay		Alfalfa hay		Potatoes		Pasture		Capability unit
	A	B	A	B	A	B	A	B	A	B	A	B	A	B	A	B	
Holston loam:	*Bu.*	*Bu.*	*Lb.*	*Lb.*	*Bu.*	*Bu.*	*Bu.*	*Bu.*	*Tons*	*Tons*	*Tons*	*Tons*	*Bu.*	*Bu.*	*Cow-acre-days* [1]	*Cow-acre-days* [1]	
Gently sloping phase	25	45	275	425	13	20	20	40	.7	1.4	2.1	2.8	100	135	60	120	IIe-3
Eroded gently sloping phase	23	42	250	400	12	18	18	36	.6	1.2	2.0	2.6	95	130	55	115	IIe-3
Sloping phase	22	38	230	375	9	16	18	35	.5	1.1	1.6	2.4	80	105	50	100	IIIe-3
Eroded sloping phase	20	36	210	350	8	15	17	34	.4	1.1	1.5	2.3	75	100	45	95	IIIe-3
Holston clay loam, severely eroded sloping phase	15	25	175	275	7	12	12	22	.3	.8	1.2	1.8	----	----	35	75	IIIe-3
Humphreys silt loam, gently sloping phase	33	50	325	450	13	23	24	45	.9	1.5	2.2	2.9	----	130	80	125	IIe-3
Huntington silt loam:																	
Phosphatic phase	55	75	----	----	18	28	35	50	1.4	1.8	----	----	----	170	120	150	I-1
Local alluvium phosphatic phase	45	65	----	450	20	28	38	52	1.4	1.8	2.4	3.6	140	180	105	140	I-1
Huntington cherty silt loam:																	
Phosphatic phase	45	60	----	----	16	26	32	48	1.3	1.6	----	----	----	165	110	140	I-1
Local alluvium phosphatic phase	40	55	----	450	14	24	25	48	1.1	1.5	2.0	3.0	80	120	85	120	IIs-1
Lawrence silt loam	15	30	150	225	----	----	----	----	.4	.9	----	----	----	----	40	75	IIIw-1
Lee silt loam	15	25	----	----	----	----	----	----	.5	1.2	----	----	----	----	50	100	IIIw-2
Lindside silt loam:																	
Phosphatic phase	45	63	----	----	----	----	----	----	1.4	1.8	----	----	----	----	115	140	IIw-1
Local alluvium phase	45	60	----	----	----	----	----	----	1.2	1.6	----	----	----	----	115	140	IIw-1
Lindside cherty silt loam:																	
Phosphatic phase	40	55	----	----	----	----	----	----	1.2	1.6	----	----	----	----	105	130	IIw-1.
Local alluvium phosphatic phase	25	45	----	----	----	----	----	----	1.0	1.4	----	----	----	----	90	125	IIs-1.
Lobelville silt loam	30	45	----	----	----	----	----	----	1.0	1.4	----	----	----	----	90	120	IIw-1
Local alluvium phase	28	42	----	----	----	----	----	----	1.0	1.3	----	----	----	----	85	115	IIw-1
Lobelville cherty silt loam, local alluvium phase	18	25	----	----	----	----	----	----	.8	1.0	----	----	----	----	80	90	IIs-1
Made land	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	VIIs-1
Mimosa silty clay loam:																	
Eroded sloping phase	25	40	250	350	16	22	28	40	.6	1.0	2.3	3.2	----	----	65	100	IIIe-4
Eroded gently sloping phase	30	48	275	375	18	25	30	45	.7	1.2	2.6	3.5	----	100	70	115	IIIe-4
Mimosa silty clay, severely eroded sloping phase	15	30	----	----	12	18	15	28	.3	.7	----	2.0	----	----	45	80	IVe-2
Mimosa cherty silt loam:																	
Eroded sloping phase	30	50	275	375	18	30	30	48	.7	1.4	2.6	3.5	----	110	70	115	IIIe-4
Eroded strongly sloping phase	25	35	----	----	15	22	25	40	.6	1.0	2.3	3.0	----	----	65	100	IVe-2
Mimosa cherty silty clay loam:																	
Severely eroded sloping phase	20	40	250	350	14	20	20	40	.6	1.0	2.3	3.0	----	----	65	100	IVe-2
Severely eroded strongly sloping phase	----	----	----	----	----	10	----	16	.3	.7	----	----	----	----	50	85	VIe-1
Mimosa, Baxter, and Colbert very rocky soils:																	
Strongly sloping phases	----	----	----	----	----	----	----	----	----	----	----	----	----	----	40	60	VIe-1
Moderately steep phases	----	----	----	----	----	----	----	----	----	----	----	----	----	----	30	40	VIIs-1
Monongahela loam:																	
Gently sloping phase	24	44	250	400	11	20	22	40	.8	1.4	----	----	----	115	60	110	IIe-4
Eroded gently sloping phase	23	42	240	400	10	18	20	36	.7	1.3	----	----	----	110	55	100	IIe-4
Level phase	25	45	260	400	11	20	20	40	.8	1.5	----	----	----	110	65	115	IIe-4
Mountview silt loam:																	
Gently sloping phase	28	45	300	425	14	20	22	42	.7	1.4	1.9	2.8	100	135	65	120	IIe-3
Eroded gently sloping phase	25	42	275	425	13	18	20	40	.6	1.3	1.8	2.6	95	130	60	115	IIe-3
Sloping phase	24	38	250	400	12	17	18	36	.5	1.1	1.6	2.5	80	95	55	100	IIIe-3
Eroded sloping phase	22	35	240	380	11	16	18	35	.5	1.1	1.6	2.4	75	90	50	95	IIIe-3
Gently sloping shallow phase	22	40	250	375	13	20	20	38	.6	1.2	1.8	2.4	85	115	60	105	IIe-2
Eroded gently sloping shallow phase	20	38	240	350	12	18	18	36	.6	1.1	1.6	2.2	80	105	55	100	IIe-2
Sloping shallow phase	19	35	235	340	11	16	16	32	.5	1.1	1.4	2.0	75	95	50	100	IIIe-2
Eroded sloping shallow phase	18	32	225	330	10	15	15	30	.5	1.1	1.3	1.9	70	90	45	90	IIIe-2
Mountview silty clay loam:																	
Severely eroded gently sloping phase	20	35	225	350	10	15	16	32	.4	1.0	1.4	2.2	----	----	40	85	IIIe-3
Severely eroded sloping phase	18	28	200	300	8	14	14	24	.3	.8	1.2	1.8	----	----	35	80	IIIe-3
Severely eroded gently sloping shallow phase	16	32	220	325	9	14	14	30	.4	1.0	1.2	1.8	70	90	40	85	IIIe-2
Severely eroded sloping shallow phase	14	24	175	250	6	12	12	22	.3	.7	1.2	1.8	----	----	35	75	IVe-1
Muskingum stony fine sandy loam, strongly sloping phase	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	75	VIIs-1
Nolichucky loam:																	
Gently sloping phase	28	45	325	475	15	22	24	42	.8	1.4	2.3	3.3	125	155	70	125	IIe-3
Eroded gently sloping phase	25	42	300	450	14	21	22	40	.8	1.4	2.2	3.2	120	150	65	120	IIe-3

See footnote at end of table.

TABLE 1.—*Expected average acre yields of principal crops under two levels of management*—Continued

Soil	Corn A	Corn B	Cotton A	Cotton B	Wheat A	Wheat B	Oats A	Oats B	Lespedeza hay A	Lespedeza hay B	Alfalfa hay A	Alfalfa hay B	Potatoes A	Potatoes B	Pasture A	Pasture B	Capability unit
	Bu.	*Bu.*	*Lb.*	*Lb.*	*Bu.*	*Bu.*	*Bu.*	*Bu.*	*Tons*	*Tons*	*Tons*	*Tons*	*Bu.*	*Bu.*	*Cow-acre-days* [1]	*Cow-acre-days* [1]	
Nolichucky clay loam, severely eroded sloping phase	17	34	200	300	7	12	14	24	.4	.8	1.4	2.2	----	----	35	75	IIIe-3
Pace cherty silt loam:																	
Eroded gently sloping phosphatic phase	30	50	----	425	15	24	30	45	.9	1.4	1.8	2.8	----	140	70	110	IIe-2
Eroded sloping phosphatic phase	20	40	----	350	12	18	20	35	.7	1.2	1.6	2.6	----	125	60	100	IIIe-2
Eroded gently sloping phase	25	45	250	375	12	20	20	35	.8	1.3	1.6	2.6	70	130	60	100	IIe-2
Eroded sloping phase	18	35	200	325	10	15	16	32	.6	1.0	1.4	2.5	60	120	55	90	IIIe-2
Pembroke silt loam, eroded gently sloping phase	35	65	375	525	20	30	32	56	1.2	1.7	3.0	3.8	160	185	85	140	IIe-1
Prader fine sandy loam	15	25	----	----	----	----	----	----	.5	1.2	----	----	----	----	45	100	IIIw-2
Purdy loam	----	25	----	----	----	----	----	----	.4	.8	----	----	----	----	35	70	IVw-1
Overwash phase	18	32	----	----	----	----	----	----	.6	1.1	----	----	----	----	50	85	IIIw-1
Robertsville silt loam	----	30	----	----	----	----	----	----	.4	1.1	----	----	----	----	35	75	IVw-1
Overwash phase	20	40	----	----	----	----	----	----	.6	1.2	----	----	----	----	50	90	IIIw-1
Rockland:																	
Moderately steep	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	VIIs-1
Sloping	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	VIIs-1
Rock outcrop	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	VIIs-1
Sango silt loam	22	38	200	350	9	16	18	34	.6	1.2	----	----	----	95	55	110	IIe-4
Sequatchie fine sandy loam:																	
Gently sloping phase	38	58	400	500	15	25	30	46	1.0	1.6	2.1	3.0	140	180	80	125	IIe-1
Eroded gently sloping phase	35	55	375	475	15	24	28	45	.9	1.4	2.0	3.0	135	175	75	120	IIe-1
Level phase	40	60	400	500	16	25	30	48	1.0	1.6	----	3.0	140	180	85	130	I-1
Sequatchie cobbly fine sandy loam, gently sloping phase	----	----	----	----	----	----	----	----	----	----	----	----	----	----	55	100	IVs-1
Sequatchie sandy clay loam, severely eroded sloping phase	20	35	200	325	10	16	15	30	.4	1.0	----	2.2	----	----	45	85	IIIe-1
Staser fine sandy loam	45	65	----	475	18	26	30	45	1.2	1.6	----	----	----	165	110	140	I-1
Local alluvium phase	40	60	375	500	20	28	35	50	1.2	1.5	----	----	140	180	100	135	I-1
Swaim silty clay loam, eroded gently sloping phase	20	40	300	400	12	18	18	40	.8	1.4	2.0	3.2	----	----	60	120	IIIe-4
Swaim silty clay, severely eroded sloping phase	----	25	200	300	8	12	14	22	.5	1.0	1.5	2.5	----	----	40	90	IVe-2
Taft silt loam	20	35	200	275	----	----	----	----	.5	1.0	----	----	----	----	50	85	IIIw-1
Overwash phase	25	42	250	350	----	----	----	----	.8	1.3	----	----	----	----	65	105	IIw-1
Talbott cherty silty clay loam, severely eroded strongly sloping phase	----	----	----	----	----	----	----	----	----	.5	----	----	----	----	25	60	VIe-1
Tyler loam	15	30	175	250	----	----	----	----	.4	.9	----	----	----	----	45	75	IIIw-1
Overwash phase	20	40	225	300	----	----	----	----	.7	1.1	----	----	----	----	60	95	IIw-1
Waynesboro loam:																	
Gently sloping phase	32	52	350	500	16	27	28	50	1.0	1.6	2.8	3.6	150	185	75	135	IIe-1
Eroded gently sloping phase	30	50	330	475	15	25	26	48	.9	1.5	2.7	3.4	145	180	70	130	IIe-1
Sloping phase	28	46	300	450	14	22	25	42	.7	1.4	2.4	3.3	125	160	70	120	IIIe-1
Eroded sloping phase	25	42	275	425	13	20	23	40	.6	1.3	2.3	3.2	120	150	65	115	IIIe-1
Strongly sloping phase	----	38	----	----	----	15	----	30	----	1.0	----	2.8	----	----	----	100	IVe-1
Waynesboro clay loam:																	
Severely eroded gently sloping phase	22	40	250	375	12	20	20	38	.5	1.1	1.8	2.8	100	130	55	95	IIIe-1
Severely eroded sloping phase	18	35	200	325	10	16	18	32	.4	1.0	1.5	2.4	----	----	45	85	IIIe-1
Severely eroded strongly sloping phase	----	----	----	----	----	11	----	18	.3	.8	----	1.6	----	----	35	70	VIe-1
Whitwell loam:																	
Gently sloping phase	33	50	300	400	12	18	20	40	1.0	1.5	----	----	----	----	75	120	IIw-1
Eroded gently sloping phase	32	45	300	400	11	17	20	40	.9	1.4	----	----	----	----	70	115	IIw-1
Level phase	35	52	300	400	12	18	20	40	1.0	1.5	----	----	----	----	80	125	IIw-1

[1] The term "cow-acre-days" is used to express the carrying capacity of pastures. It represents the number of days per year that 1 animal unit can be supported on 1 acre without injury to the pasture, or the product of the number of animal units to the acre multiplied by the number of days of grazing. The animal unit is a means of measuring the feed requirements of livestock. It is the equivalent of 1 mature cow, steer, or horse, 5 hogs, or 7 sheep or goats. For example, the soil type that would provide grazing for 1 cow to the acre for 100 days would rate 100 cow-acre-days, and another soil that would provide grazing for 1 cow on 4 acres for 100 days would rate 25 cow-acre-days.

The yields in columns B represent those expected under good management. Good management refers to the proper choice and rotation of crops; the correct use of commercial fertilizers, lime, and manure; proper tillage methods; the return of organic matter to the soil; mechanical means of water control used to maintain the productivity or increase it within practical limits; the improvement of workability; and the conservation of soil material, plant nutrients, and soil moisture. The yields under columns A probably can be increased to those under columns B after completion of one to two suitable rotation cycles. For example, a soil that is suitable for a row crop every third year would generally require 3 to 6 years to reach the yields in columns B under the prescribed management.

Present knowledge concerning good management of specific soils for specific crops is limited; but some deficiencies of the soils are known, and the probability of other deficiencies is fairly well established. Factors that may determine, in part, the level of good management for the soils on a particular farm include the proportionate acreage and distribution of the various soils on the farm, the combination of industries in the farm business, location of the farm relative to markets and other facilities, size of farm, and prices.

The expected yields in columns B are based largely on estimates of men who have had experience with the soils and crops. These estimates have been made with a consideration of the known deficiencies of the soil and the increases in crop yields that can be expected if the deficiencies are corrected within practical limits. These limits cannot be precisely defined, and the response to improved management cannot be precisely predicted for a given crop on a given soil. Some unknown deficiency that is not corrected may affect yields. Yields higher than those given in columns B may be obtained on a given soil for a given year, but these higher yields probably cannot be obtained year after year. The yields given, however, may be surpassed in the future when better management practices are found and higher yielding crop varieties are developed. There are practically no soils in Coffee County on which more intensive management will not bring satisfactory increases in yields.

The Soils of Coffee County

The soils of Coffee County range in color from white through gray, yellow, and brown to red. Generally, the surface soil is light gray to brown and the subsoil is red or yellowish brown. The soils range from loose or noncoherent sand to very firm clay. The surface soil is mainly silt loam or loam. It is generally mellow and friable. The subsoil is mainly silty clay loam, clay loam, or clay and is friable to very firm.

The soils range from level to steep but are mostly gently sloping to strongly sloping. A large acreage is uneroded or only slightly eroded. Some soils are moderately eroded; others are severely eroded. A small acreage is gullied. Loose fragments of chert, cobbles, gravel, or stones interfere with cultivation in many places. Many outcrops of bedrock are mapped as very rocky soils—Rock outcrop, and Rockland.

The soils of the uplands and terraces have been severely leached; consequently they are acid and relatively low in fertility and organic matter. Many of the soils of the bottom lands and low terraces are high in natural fertility. They contain a moderate amount of lime and a fair amount of organic matter.

Some of the soils of the county are highly productive, easy to work, and easy to conserve. Others are low in productivity, difficult to work, and difficult to conserve. Most of the soils, however, are between these two extremes. About 76 percent of the county is believed to be suitable for crops, 13 percent suitable for permanent pasture, and 11 percent suitable only for forest.

Table 2 is a key to the soil series of Coffee County. It groups the series according to the position in the landscape and gives some of their characteristics.

Descriptions of Soils

This subsection is provided for those who want detailed information about soils. It describes the single soils, or mapping units in this county; that is, the areas on the detailed soil map that are bound by lines and identified by a letter symbol. For more general information about soils, the reader can refer to the section, Soil Associations, in which the broad patterns of soils are described.

The descriptions of the individual soils follow a series description that gives characteristics common to the soils of a series. All the soils of one series that have the same texture in the surface layer are together. For example, all the Baxter soils that have a cherty silt loam surface soil come together, and then all Baxter soils that have a cherty silty clay loam surface soil. Ordinarily, only one soil is described in detail for each series. An important part of this description is the soil profile, a record of what the soil scientist saw and learned when he dug into the ground. It is to be assumed that all other soils in a series will have essentially the same kind of profile. The difference, if any, will be in texture of the surface soil or in thickness of the surface soil. To illustrate, a detailed profile is given for Baxter cherty silt loam, sloping phase, and the reader is to conclude that all the other Baxter soils have essentially this kind of profile. The differences, if any, are explained.

In describing soils, the scientist frequently assigns a letter symbol, for example, "A_1," to the various layers. These letter symbols have special meaning that concern scientists and others who desire to make a special study of soils. Most readers will need to remember only that all letter symbols beginning with "A" are surface soil; those beginning with "B" are subsoil; those beginning with "C" are substratum, or parent material; and those beginning with "D" are underlying rock or material.

Following the name of each soil, or mapping unit, are two sets of symbols in parentheses. The first is a symbol used to identify the soil on the detailed map; the second is the capability unit in which the soil has been placed. The description that follows these symbols points out slope, erosion, and similar properties that distinguish this particular soil from the others. Frequently, the characteristics emphasized for a single soil are those that directly affect its management. For example, there are five Baxter soils that have a cherty silt loam surface layer and are similar in profile, but these soils differ in slope, a characteristic that affects their management.

The location and distribution of the single soils are shown on the soil map at the back of this report. Their

TABLE 2.—*Key to the soil*

[Capital letters in parentheses after each series refer to the great soil Reddish-Brown Lateritic; G–B, Gray-Brown Podzolic; P, Planosols; L–HG, Low-

SOILS OF

Series	Topographic position	Parent material	Slope
			Percent
Hartsells (R–Y)	Cumberland Plateau ridgetops	Residuum from sandstone	2–12
Muskingum (L)	Cumberland Escarpment	Residuum from sandstone	5–20
Cookeville (R–Y)	Highland Rim	Residuum from moderately high-grade[2] limestone	2–20
Decatur (R–B)	Highland Rim	Residuum from high-grade limestone	2–12
Baxter (R–Y)	Highland Rim barrens	Residuum from cherty limestone	2–20
Bodine (R)	Highland Rim barrens	Residuum from cherty limestone	5–30+
Pembroke (R–B)	Highland Rim	Thin mantle of loesslike silt overlying residuum from high-grade limestone.	2–5
Mountview (R–Y)	Highland Rim barrens	Thin mantle of loesslike silt overlying residuum from cherty limestone.	2–12
Dickson (R–Y)	Highland Rim barrens	Same	2–5
Sango (R–Y)	Highland Rim barrens	Same	0–5
Lawrence (P)	Highland Rim barrens	Same	0–2
Guthrie (P)	Highland Rim barrens	Same	0–2
Mimosa (G–B)	Central Basin	Residuum from phosphatic argillaceous limestone	2–20
Colbert (R–Y)	Central Basin	Residuum from argillaceous limestone	12–30
Talbott (R–Y)	Ridge and karst slopes	Residuum from cherty argillaceous limestone	12–20

SOILS OF

Series	Topographic position	Parent material	Slope
Swaim (R–Y)	Foot slopes and benches on Highland Rim.	Old colluvium and local alluvium from upland soils underlain chiefly by argillaceous limestone.	2–12
Greendale (A)	Foot slopes, colluvial fans, depressions, and along drainageways in Highland Rim barrens.	Recent colluvium and local alluvium from upland soils underlain by cherty limestone.	0–5
Dellrose (G–B)	Foot slopes in Central Basin	Old colluvium and local alluvium from upland soils underlain chiefly by cherty limestone.	12–30+
Hermitage (R–B)	Foot slopes and benches	Old colluvium and local alluvium from upland soils underlain chiefly by high-grade limestone.	2–12
Pace (R–Y)	Foot slopes, benches, and colluvial fans.	Old colluvium and local alluvium from upland soils underlain chiefly by cherty limestone.	2–12
Emory (A)	Foot slopes, colluvial fans, depressions, and along drainageways.	Recent colluvium and local alluvium derived from upland soils underlain by high-grade limestone.	0–5

See footnotes at end of table.

series of Coffee County, Tenn.

group to which the series belongs: R–Y, Red-Yellow Podzolic; R–B,
Humic Gley; HG, Humic Gley; L, Lithosols; R, Regosols; and A, Alluvial soils]

UPLANDS

Natural drainage	Soil depth [1]	Degree of profile development	Contrast between horizons
Well drained	Shallow to very deep	Medium	Medium.
Excessively drained	Shallow to deep	Weak	Weak.
Well drained	Deep to very deep	Strong	Strong.
Well drained	Very deep	Medium	Medium.
Well drained	Deep to very deep	Medium	Medium.
Somewhat excessively drained	Shallow to deep	Weak	Weak.
Well drained	Very deep	Strong	Strong.
Well drained	Shallow to deep	Strong	Strong.
Moderately well drained	Moderately deep to deep	Very strong	Strong.
Moderately well drained	Moderately deep to deep	Very strong	Strong.
Somewhat poorly drained	Shallow to very deep	Strong	Strong.
Poorly drained	Shallow to very deep	Strong	Strong.
Well drained	Moderately deep to very deep	Medium	Medium.
Somewhat poorly drained to moderately well drained.	Shallow	Strong	Strong.
Well drained	Shallow to very deep	Strong	Strong.

COLLUVIAL LANDS

Natural drainage	Soil depth [1]	Degree of profile development	Contrast between horizons
Moderately well drained to well drained	Shallow to very deep	Medium	Medium.
Same	Shallow to very deep	Weak	Weak.
Well drained to somewhat excessively drained	Shallow to very deep	Weak	Weak.
Well drained	Deep to very deep	Strong	Medium.
Moderately well drained to well drained	Deep to very deep	Strong	Strong.
Well drained	Shallow to very deep	Weak	Weak.

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TABLE 2.—*Key to the soil series of*

SOILS OF

Series	Topographic position	Parent material	Slope
			Percent
Cumberland (R–B)	High stream terraces in Highland Rim.	Old alluvium from upland soils underlain by limestone and some sandstone.	2–12
Humphreys (R–Y)	Low stream terraces in Highland Rim barrens.	Old alluvium from upland soils underlain by limestone	2–5
Captina (R–Y)	Medium high and low stream terraces in Highland Rim.	Old alluvium from upland soils underlain by limestone and some sandstone.	0–5
Robertsville (P)	High and low stream terraces in Highland Rim.	Same	0–2
Nolichucky (R–Y)	High stream terraces in Highland Rim.	Old alluvium from upland soils underlain by sandstone and some limestone.	2–12
Waynesboro (R–Y)	Same	Same	2–20
Holston (R–Y)	Medium high to high stream terraces in Highland Rim.	Same	2–12
Monongahela (R–Y)	Same	Same	0–5
Purdy (P)	High stream terraces in Highland Rim.	Same	0–2
Tyler (P)	High to low stream terraces in Highland Rim.	Same	0–5
Etowah (R–Y)	Medium high stream terraces	Old alluvium from upland soils underlain by limestone and some sandstone.	2–12
Taft (P)	Low and high stream terraces	Same	0–5
Sequatchie (G–B)	Low stream terraces	Old alluvium from upland soils underlain by sandstone and some limestone.	0–12
Whitwell (G–B)	Low stream terraces	Same	0–5
Armour (R–Y)	Low and medium high stream terraces and foot slopes in Central Basin.	Old general alluvium and local alluvium from uplands underlain by limestone, chiefly phosphatic.	2–12
SOILS OF			
Lobelville (A)	First bottoms in Highland Rim barrens.	Recent alluvium from upland soils underlain by limestone, mainly low grade.	0–3
Lee (L–HG)	Same	Same	0–2
Huntington (A)	First bottoms in Central Basin	Recent alluvium from upland soils underlain by limestone, mainly phosphatic.	0–5
Lindside (A)	Same	Same	0–2
Dunning (HG)	Same	Recent alluvium from upland soils underlain chiefly by limestone.	0–2
Staser (A)	Same	Recent alluvium from upland soils underlain by sandstone and some limestone.	0–5
Hamblen (A)	Same	Same	0–2
Prader (L–HG)	Same	Same	0–2
Bruno (A)	Same	Recent alluvium from upland soils underlain chiefly by sandstone.	0–5

[1] Soil depth is the depth of the soil to significantly different material, such as bedrock or a bed of gravel. The soil-depth classes used are very shallow, 0 to 8 inches; shallow, 8 to 25 inches; moderately deep, 25 to 35 inches; deep, 35 to 60 inches; and very deep, 60 inches or more.

Coffee County, Tenn.—Continued

TERRACE LANDS

Natural drainage	Soil depth [1]	Degree of profile development	Contrast between horizons
Well drained	Shallow to very deep	Medium	Medium.
Well drained	Deep to very deep	Medium	Medium.
Moderately well drained	Moderately deep to very deep	Strong	Strong.
Poorly drained	Shallow to very deep	Strong	Strong.
Well drained	Deep to very deep	Strong	Very strong.
Well drained	Deep to very deep	Strong	Strong.
Well drained	Deep to very deep	Strong	Strong.
Moderately well drained	Deep to very deep	Very strong	Strong.
Poorly drained	Moderately deep to very deep	Strong	Strong.
Somewhat poorly drained	Deep to very deep	Strong	Strong.
Well drained	Moderately deep to very deep	Strong	Medium.
Somewhat poorly drained	Deep to very deep	Strong	Strong.
Well drained	Deep to very deep	Medium	Medium.
Moderately well drained	Deep to very deep	Medium	Medium.
Well drained	Shallow to very deep	Strong	Medium.

BOTTOM LANDS

Natural drainage	Soil depth [1]	Degree of profile development	Contrast between horizons
Somewhat poorly drained to moderately well drained.	Shallow to deep	Medium	Weak.
Poorly drained	Shallow to deep	Medium	Medium.
Well drained	Deep to very deep	Weak	Weak.
Somewhat poorly drained to moderately well drained.	Deep to very deep	Medium	Weak.
Somewhat poorly drained	Moderately deep to deep	Weak	Medium.
Well drained	Shallow to very deep	Weak	Weak.
Somewhat poorly drained to moderately well drained.	Deep to very deep	Weak	Weak.
Poorly drained	Deep to very deep	Medium	Medium.
Excessively drained	Deep to very deep	Very weak	Very weak.

[2] High-grade, as used in this table, refers to rocks that give rise to soils that are high in plant nutrients.

TABLE 3.—*Approximate acreage and proportionate extent of the soils mapped in Coffee County, Tenn.*

Soil	Acres	Percent
Armour silt loam:		
Eroded gently sloping phase	1, 058	0. 4
Eroded sloping phase	457	. 2
Baxter cherty silt loam:		
Eroded sloping phase	1, 609	. 6
Eroded strongly sloping phase	208	. 1
Gently sloping phase	1, 284	. 5
Sloping phase	568	. 2
Strongly sloping phase	396	. 1
Baxter cherty silty clay loam:		
Severely eroded gently sloping phase	135	(1)
Severely eroded sloping phase	1, 525	. 5
Severely eroded strongly sloping phase	692	. 2
Bodine cherty silt loam:		
Moderately steep phase	16, 823	6. 0
Sloping phase	6, 672	2. 4
Steep phase	1, 979	. 7
Strongly sloping phase	4, 057	1. 5
Bouldery colluvial land, strongly sloping phase	787	. 3
Bruno loamy fine sand	102	(1)
Captina silt loam:		
Eroded gently sloping phase	1, 691	. 6
Gently sloping phase	1, 450	. 5
Level phase	47	(1)
Cookeville silt loam:		
Eroded gently sloping phase	2, 163	. 8
Eroded sloping phase	451	. 2
Gently sloping phase	358	. 1
Sloping phase	118	(1)
Cookeville silty clay loam:		
Gullied sloping phase	107	(1)
Severely eroded gently sloping phase	434	. 2
Severely eroded sloping phase	1, 769	. 6
Severely eroded strongly sloping phase	147	. 1
Cumberland silt loam:		
Eroded gently sloping phase	2, 649	1. 0
Eroded sloping phase	259	. 1
Gently sloping phase	283	. 1
Cumberland silty clay loam:		
Severely eroded gently sloping phase	505	. 2
Severely eroded sloping phase	961	. 3
Decatur silty clay loam, eroded gently sloping phase	301	. 1
Decatur silty clay, severely eroded sloping phase	386	. 1
Dellrose cherty silt loam:		
Eroded strongly sloping phase	737	. 3
Moderately steep phase	7, 053	2. 5
Steep phase	268	. 1
Dellrose cherty silty clay loam:		
Severely eroded moderately steep phase	341	. 1
Severely eroded strongly sloping phase	81	(1)
Dickson silt loam:		
Eroded gently sloping phase	21, 959	8. 0
Gently sloping phase	24, 909	9. 0
Dunning silty clay loam, drained phase	358	. 1
Dunning silt loam:		
Drained overwash phase	375	. 1
Silty substratum phase	754	. 3
Emory silt loam	2, 785	1. 0
Etowah silt loam:		
Eroded gently sloping phase	531	. 2
Eroded gently sloping phosphatic phase	94	(1)
Eroded sloping phosphatic phase	108	(1)
Etowah silty clay loam, severely eroded sloping phase	90	(1)
Gravelly alluvial land	409	. 1
Greendale cherty silt loam	584	. 2
Greendale silt loam	4, 487	1. 6
Gullied land	166	0. 1
Guthrie silt loam	9, 128	3. 3
Guthrie silt loam, overwash phase	87	(1)
Hamblen fine sandy loam	2, 188	. 8
Hamblen fine sandy loam, local alluvium phase	709	. 3
Hartsells fine sandy loam:		
Gently sloping phase	790	. 3
Sloping phase	596	. 2
Hermitage cherty silt loam, eroded sloping phase	181	. 1
Hermitage silt loam:		
Eroded gently sloping phase	879	. 3
Eroded sloping phase	112	(1)
Gently sloping phase	774	. 3
Holston clay loam, severely eroded sloping phase	261	. 1
Holston loam:		
Eroded gently sloping phase	2, 444	1. 0
Eroded sloping phase	181	. 1
Gently sloping phase	1, 209	. 4
Sloping phase	92	(1)
Humphreys silt loam, gently sloping phase	836	. 3
Huntington cherty silt loam:		
Local alluvium phosphatic phase	2, 038	. 7
Phosphatic phase	1, 249	. 4
Huntington silt loam:		
Local alluvium phosphatic phase	237	. 1
Phosphatic phase	364	. 1
Lawrence silt loam	15, 896	5. 7
Lee silt loam	3, 206	1. 2
Lindside cherty silt loam:		
Local alluvium phosphatic phase	600	. 2
Phosphatic phase	635	. 2
Lindside silt loam:		
Local alluvium phase	806	. 3
Phosphatic phase	356	. 1
Lobelville cherty silt loam, local alluvium phase	461	. 2
Lobelville silt loam	3, 622	1. 3
Lobelville silt loam, local alluvium phase	8, 305	3. 0
Made land	95	(1)
Mimosa cherty silt loam:		
Eroded sloping phase	493	. 2
Eroded strongly sloping phase	491	. 2
Mimosa cherty silty clay loam:		
Severely eroded sloping phase	63	(1)
Severely eroded strongly sloping phase	380	. 1
Mimosa silty clay, severely eroded sloping phase	194	. 1
Mimosa silty clay loam:		
Eroded gently sloping phase	126	(1)
Eroded sloping phase	368	. 1
Mimosa, Baxter, and Colbert very rocky soils:		
Moderately steep phases	1, 385	. 5
Strongly sloping phases	1, 752	. 6
Mines, Pits and Dumps	193	. 1
Monongahela loam:		
Eroded gently sloping phase	286	. 1
Gently sloping phase	2, 678	1. 0
Level phase	96	(1)
Mountview silt loam:		
Eroded gently sloping phase	19, 141	7. 0
Eroded gently sloping shallow phase	5, 439	2. 0
Eroded sloping phase	903	. 3
Eroded sloping shallow phase	4, 914	2. 0
Gently sloping phase	11, 595	4. 2
Gently sloping shallow phase	2, 184	. 8
Sloping phase	649	. 2
Sloping shallow phase	2, 346	. 8

See footnote at end of table.

TABLE 3.—*Approximate acreage and proportionate extent of the soils mapped in Coffee County, Tenn.*—Continued

Soil	Acres	Percent
Mountview silty clay loam:		
Severely eroded gently sloping phase	249	0.1
Severely eroded gently sloping shallow phase	103	[1]
Severely eroded sloping phase	867	.3
Severely eroded sloping shallow phase	1,821	.7
Muskingum stony fine sandy loam, strongly sloping phase	499	.2
Nolichucky clay loam, severely eroded sloping phase	425	.2
Nolichucky loam:		
Eroded gently sloping phase	662	.2
Gently sloping phase	366	.1
Pace cherty silt loam:		
Eroded gently sloping phase	456	.2
Eroded gently sloping phosphatic phase	612	.2
Eroded sloping phase	138	[1]
Eroded sloping phosphatic phase	879	.3
Pembroke silt loam, eroded gently sloping phase	650	.2
Prader fine sandy loam	787	.3
Purdy loam	2,832	1.0
Purdy loam, overwash phase	134	[1]
Robertsville silt loam	726	.3
Robertsville silt loam, overwash phase	124	[1]
Rockland:		
Moderately steep	9,578	3.4
Sloping	391	.1
Rock outcrop	193	.1
Sango silt loam	7,850	2.8
Sequatchie cobbly fine sandy loam, gently sloping phase	97	[1]
Sequatchie fine sandy loam:		
Eroded gently sloping phase	1,458	.5
Gently sloping phase	301	.1
Level phase	129	[1]
Sequatchie sandy clay loam, severely eroded sloping phase	87	[1]
Staser fine sandy loam	604	.2
Staser fine sandy loam, local alluvium phase	400	.1
Swaim silty clay, severely eroded sloping phase	262	.1
Swaim silty clay loam, eroded gently sloping phase	311	.1
Taft silt loam	786	.3
Taft silt loam, overwash phase	288	.1
Talbott cherty silty clay loam, severely eroded strongly sloping phase	230	.1
Tyler loam	2,709	1.0
Tyler loam, overwash phase	346	.1
Water area (lakes and ponds)	770	.3
Waynesboro clay loam:		
Severely eroded gently sloping phase	362	.1
Severely eroded sloping phase	1,340	.5
Severely eroded strongly sloping phase	197	.1
Waynesboro loam:		
Eroded gently sloping phase	2,495	1.0
Eroded sloping phase	216	.1
Gently sloping phase	285	.1
Sloping phase	126	[1]
Strongly sloping phase	59	[1]
Whitwell loam:		
Eroded gently sloping phase	200	.1
Gently sloping phase	753	.3
Level phase	714	.3
Total	278,400	100.0

[1] Less than 0.1 percent.

approximate acreage and proportionate extent are given in table 3. It will be helpful to refer to the section, Soil Survey Methods and Definitions, where "series," "type," "phases," and other special terms used in describing soils are listed. The Glossary at the end of the report defines many other special terms.

Armour series

The Armour series consists of well-drained soils that were derived either from old general alluvium deposited on low and medium-high stream terraces or from local alluvium accumulated on foot slopes. The materials have washed largely from the Mimosa and Dellrose soils, though some are from other phosphatic soils.

Armour soils have a dark-brown or brown friable silt loam surface soil and a brown or reddish-brown to strong-brown friable to firm silty clay loam subsoil.

The color of the B horizon varies from brown to reddish brown on the higher and more sloping areas to strong brown through yellowish brown or dark yellowish brown on gently sloping areas, particularly those on stream terraces. The texture of the subsoil and substratum ranges from silty clay loam to silty clay. The thickness of the solum ranges from 2 to 5 feet or more. A few areas contain some chert.

The Armour soils are dominantly gently sloping to sloping, but some areas are strongly sloping. In this county Armour soils occur only in soil associations 1 and 2. They are extensive and widely distributed in association 2. These are important agricultural soils in Coffee County, though their total acreage is not great.

Armour soils are associated chiefly with the Pace, Dellrose, Mimosa, Etowah, and Huntington soils. They are less cherty than the Pace and Dellrose soils, are darker colored than the Etowah soils, and have a less firm subsoil than the Mimosa soils. The Armour soils have a moderately well developed ABC profile, and the Huntington soils have a weakly developed AC profile.

Armour silt loam, eroded gently sloping phase (Aa) (Capability unit IIe–1).—A profile of this soil in a cultivated area is described as follows:

A_p 0 to 6 inches, dark-brown (10YR 3/3 or 7.5YR 3/2) or brown (10YR 4/3) friable silt loam; weak fine granular structure; range in thickness, 5 to 9 inches.

A_3 6 to 10 inches, brown (10YR 4/3 or 7.5YR 4/4) friable silt loam; weak fine granular to weak fine subangular blocky structure; range in thickness, 2 to 6 inches.

B_1 10 to 12 inches, brown (7.5YR 4/4) or reddish-brown (5YR 4/4) friable light silty clay loam; weak to moderate fine subangular blocky structure; patchy clay skins; a few black concretions and finely divided chert gravel; range in thickness, 4 to 8 inches.

B_2 12 to 38 inches, reddish-brown (5YR 4/4), brown (7.5YR 4/4), strong-brown (7.5YR 5/6), or yellowish-brown (10YR 5/4) friable to firm silty clay loam; moderate fine or medium subangular blocky or blocky structure; continuous clay skins; a few black concretions or segregations 1.0 to 2.0 millimeters in diameter and a few pieces of chert gravel ½ to 2 inches in diameter; range in thickness, 15 to 24 inches.

B_3 38 to 45 inches, reddish-brown (5YR 4/4) or strong-brown (7.5YR 5/6) friable to firm silty clay loam; many pale-brown (10YR 6/3), yellowish-brown (10YR 5/4), and yellowish-red (5YR 5/6 or 5/8) variegations; moderate fine to medium blocky or subangular blocky structure; patchy to continuous clay skins; few to many pieces of fine chert gravel; moderate number of black concretions and segregations or stains 1.0 to 5.0 millimeters in diameter; range in thickness, 6 to 12 inches.

C 45 to 60 inches, strong-brown (7.5YR 5/6) firm cherty silty clay loam or silty clay; many, fine, distinct light yellowish-brown (10YR 6/4), pale-brown (10YR 6/3), yellowish-brown (10YR 5/6), brownish-yellow (10YR 6/6), and reddish-brown (5YR 4/4) variegations and a few, fine, faint, brown (7.5YR 4/4) variegations; weak fine to medium subangular blocky structure; patchy clay skins on vertical faces of structure peds; many black concretions or segregations 1.0 to 5.0 millimeters in diameter; pieces of chert gravel present range mostly from ½ to 3 inches in diameter.

A very small acreage differs from the profile described in having a surface soil of brown friable silty clay loam.

Surface runoff is slow to medium, and internal drainage is medium. The soil contains a moderate quantity of organic matter and has a medium to large supply of plant nutrients. It is slightly acid to strongly acid and has a high available water-holding capacity. Permeability to air, water, and plant roots is moderate in the surface soil and moderate to slow in the subsoil. The soil is very easy to work, and the risk of erosion is slight to moderate. The high productivity of this soil is easy to maintain (fig. 5).

Figure 5.—**Corn and alfalfa on Armour silt loam, eroded gently sloping phase, on valley slopes in the Central Basin.**

Armour silt loam, eroded sloping phase (Ab) (Capability unit IIIe–1).—This soil differs from Armour silt loam, eroded gently sloping phase, chiefly in having more rapid surface runoff and in being more erodible, somewhat more variable in depth, and, on the average, slightly less deep.

Included with this soil are small areas that differ in slope and degree of erosion. About 50 acres is severely eroded; 16 acres is strongly sloping and severely eroded; and 20 acres is strongly sloping. The severely eroded areas have a brown, reddish-brown, or dark yellowish-brown surface soil of friable silty clay loam.

Baxter series

The Baxter series consists of deep to very deep well-drained upland soils that were derived from weathered cherty limestone. They have developed under a mixed hardwoods forest on gently sloping to strongly sloping ridge-and-karst relief.

Baxter soils have a grayish-brown, yellowish-brown, dark grayish-brown or yellowish-red very friable to firm cherty surface soil and a yellowish-red to dark-red friable to very firm cherty subsoil.

The steeper slopes have a wide range in depth to bedrock and average somewhat less deep than the smoother slopes. Depth to bedrock ranges from 3 to more than 12 feet. Angular chert fragments ½ to 6 inches in diameter are on the surface and distributed throughout the soil profile in quantities that interfere with tillage. In places the chert makes up 25 to 50 percent of the soil mass.

The Baxter soils occur in small and medium-sized areas that are widely distributed throughout most of the county. They are most extensive and of the greatest agricultural importance in the Mountview-Baxter-Lobelville soil association. They are inextensive and their areas are widely distributed in the Bodine-Dellrose soil association, where they occur chiefly on the ridgetops, and in several other soil associations, where they occur on steeper slopes along drainageways and on the more sloping and strongly sloping landscapes.

Baxter soils are most commonly associated with the Cookeville, Bodine, Talbott, and Mountview soils. They are lighter colored and more leached than the Cookeville soils and deeper than the Bodine soils. The parent material, residuum from cherty limestone, differs from that of the Talbott soil, which is residuum from cherty argillaceous limestone; and from that of the Mountview soils, which is loesslike silt overlying residuum from cherty limestone.

Baxter cherty silt loam, sloping phase (Bb) (Capability unit IIIe–2).—A profile of this soil under deciduous forest is described as follows:

A_{00} and A_0 1 to 0 inch, forest litter and leaf mold.

A_1 0 to 1 inch, grayish-brown (10YR 5/2) very friable cherty silt loam stained with dark gray (10YR 4/1); weak fine crumb structure; strongly acid; range in thickness, 0 to 2 inches.

A_2 1 to 6 inches, yellowish-brown (10YR 5/4) very friable cherty silt loam; weak fine granular structure; strongly acid; range in thickness, 4 to 8 inches.

A_3 6 to 9 inches, reddish-yellow (7.5YR 6/6) or yellowish-brown (10YR 5/4) friable cherty silt loam; weak very fine subangular blocky structure; strongly acid; range in thickness, 1 to 4 inches.

B_1 9 to 13 inches, yellowish-red (5YR 5/6 to 5/8) friable cherty silty clay loam; a few, fine, faint, reddish-yellow (5YR 6/6) and yellowish-brown (10YR 5/6) variegations; moderate fine blocky and subangular blocky structure; patchy clay skins; strongly acid; 2 to 8 inches thick.

B_2 13 to 33 inches, yellowish-red (5YR 5/6), red (2.5Y 5/6), or dark-red (2.5Y 3/6) firm cherty silty clay or silty clay loam; a few to a moderate number of fine, distinct brownish-yellow (10YR 6/6) or yellowish-brown (10YR 5/6) variegations; moderate to strong fine and medium blocky structure; continuous clay skins; strongly acid; range in thickness, 10 to 30 inches.

B_3 33 to 48 inches, dark-red (2.5YR 3/6), red (2.5YR 4/6), or yellowish-red (5YR 5/8 to 4/6) firm or very firm cherty silty clay or clay; a moderate number of fine, prominent, reddish-yellow (7.5YR 7/6) variegations and a few fine, prominent, gray (10YR 6/1) and brownish-yellow(10YR 6/6) variegations; strong medium blocky structure; continuous clay skins; strongly acid; range in thickness, 3 to 18 inches.

C 48 to 60 inches +, red (2.5YR 4/6) very firm cherty clay; many, fine to medium, prominent, brownish-yellow (10YR 6/6) variegations; weak to moderate medium blocky structure; patchy clay skins; strongly acid.

This soil is low in organic matter, medium to low in plant nutrients, and strongly acid in reaction. Internal drainage is medium, and water is readily absorbed but is only moderately well retained. Permeability is moderately rapid in the surface soil and moderately slow in the subsoil. Workability is good, and good tilth is fairly easy to maintain. The hazard of erosion is moderate.

Baxter cherty silt loam, eroded sloping phase (Bc) (Capability unit IIIe–2).—This soil differs from Baxter cherty silt loam, sloping phase, in having a somewhat shallower surface soil. The surface soil is dark grayish-brown or brown very friable cherty silt loam, 5 to 8 inches in thickness.

Baxter cherty silt loam, gently sloping phase (Ba) (Capability unit IIe–2).—This soil differs from Baxter cherty silt loam, sloping phase, chiefly in having a somewhat thicker and more silty A horizon. It further differs in that it includes a large acreage of Baxter cherty silt loam, eroded gently sloping phase, which is not mapped separately in this county. This included soil has a brown or dark grayish-brown plow layer or surface soil 6 to 8 inches in thickness.

Baxter cherty silt loam, strongly sloping phase (Bd) (Capability unit IVe–1).—This soil differs from Baxter cherty silt loam, sloping phase, chiefly in depth to bedrock. The solum varies somewhat more in depth and averages slightly less deep than that of the sloping phase. Included with this soil are areas that have moderately steep slopes. These included areas, small and widely distributed, have a total extent of about 80 acres.

Baxter cherty silt loam, eroded strongly sloping phase (Be) (Capability unit IVe–1).—This soil differs from Baxter cherty silt loam, sloping phase, chiefly in having a dark grayish-brown or brown surface soil or plow layer, 5 to 7 inches in thickness, in being somewhat more variable in characteristics, and in having slightly less depth to bedrock. Locally some of the redder upper part of the subsoil has been incorporated in the plow layer. About 25 acres that have moderately steep slopes and occur in small widely separated areas are included with this soil as mapped.

Baxter cherty silty clay loam, severely eroded sloping phase (Bg) (Capability unit IVe–1).—This soil differs from Baxter cherty silt loam, sloping phase, in having a reddish-brown or yellowish-red friable to firm surface soil. This soil is poorly suited to row crops because of its medium to rapid surface runoff, low water-supplying capacity, low supply of plant nutrients, low productivity, and poor tilth.

Included is a small acreage having a moderate number of gullies. Most of these gullies are shallow, and many can be filled in by cultivation. A few of the gullies are deep and not crossable with farm machinery.

Baxter cherty silty clay loam, severely eroded gently sloping phase (Bf) (Capability unit IIIe–2).—This soil differs from Baxter cherty silt loam, sloping phase, in having a friable to firm, reddish-brown or yellowish-red cherty silty clay loam surface soil. This soil is less suited to intertilled crops than the sloping phase because it is finer, has a lower water-supplying capacity, generally contains less plant nutrients, and has poorer tilth.

Baxter cherty silty clay loam, severely eroded strongly sloping phase (Bh) (Capability unit VIe–1).—This soil differs from Baxter cherty silt loam, sloping phase, chiefly in having a friable to firm, reddish-brown or yellowish-red cherty silty clay surface soil. Strong slopes, rapid surface runoff, low water-supplying capacity, low productivity, low or very low plant-nutrient supply, poor or very poor tilth, poor conservability, and high erosion hazard make this soil poor for row crops.

Included with this soil are about 6 acres of soil on moderately steep slopes. The areas are small and widely separated and have a moderate number of gullies. Many of the gullies are shallow and can be filled in by plowing. A few are deep and cannot be crossed with farm machinery. Also included is a total of about 30 acres of Baxter cherty silty clay loam on moderately steep slopes.

Bodine series

The Bodine series consists of somewhat excessively drained, shallow to deep, cherty soils on uplands. These soils were derived from weathered cherty limestone of the Fort Payne formation. They have formed in a highly dissected landscape having a well-defined dendritic drainage pattern. The Bodine soils are on long, narrow, sloping ridgetops and rather long, convex, strongly sloping to steep ridge slopes. They have formed under a mixed hardwoods forest that has a high proportion of oak and hickory.

The Bodine soils have a dark-gray to light yellowish-brown, very friable, cherty silt loam surface soil and a light yellowish-brown or yellowish-brown, friable, very cherty silt loam to silty clay loam subsoil.

The depth of the soils to chert beds ranges from 18 to 36 inches. A thin weakly developed B_2 horizon is evident in many profiles. The amount of chert varies considerably from place to place. The angular chert fragments range mostly from ½ to 4 inches in diameter, but a few are 10 inches in diameter.

Bodine soils occur principally in medium and large areas in the Bodine-Dellrose soil association; they make up an estimated 50 percent of that association. The soils are used mainly for pasture and forest. Only a small part on the smoother slopes is used for crops.

The Bodine soils are associated mostly with the Mountview, Baxter, and Dellrose soils. The Bodine soils, like the Baxter, occur on ridgetops; the Mountview, on the smoother and broader ridges; and the Dellrose, on the lower ridge slopes. The Bodine soils differ from the Baxter in having a less well defined ABC profile that is not so deep, more cherty, and, in the subsoil, more friable.

Bodine cherty silt loam, moderately steep phase (Bn) (Capability unit VIe–2).—The following is a profile description of this soil in a forested area:

A_{00} and A_0 1 to 0 inch, leaf mold and forest litter; range in thickness, 0 to 1 inch.

A_1 0 to 1 inch, dark-gray (10YR 4/1) very friable cherty silt loam; weak fine crumb structure; strongly acid.

A_2 1 to 9 inches, pale-brown (10YR 6/3) or light yellowish-brown (10YR 6/4) very friable cherty silt loam; weak fine granular structure; strongly acid; range in thickness, 4 to 10 inches.

C_1 9 to 22 inches, light yellowish-brown (10YR 6/4) or yellowish-brown (10YR 5/4 to 5/6) friable very cherty silt loam or silty clay loam; weak fine subangular blocky structure; chert fragments ½ to 6 inches in diameter make up 40 to 60 percent of the soil mass; strongly or very strongly acid; range in thickness, 8 to 24 inches.

C_2 22 to 96 inches, chert beds intersilted with silty clay loam or silty clay that shows a moderate number of fine, faint to distinct, brownish-yellow (10YR 6/6) and reddish-yellow (7.5YR 6/6) variegations and a few to a moderate number of fine, prominent, red, gray, and brown variegations; fragments or chert beds compose 70 percent or more of the soil mass; bedrock at depths of 8 to 25 feet or more.

In a large included acreage the soil differs from that described in being eroded and in having a 6-inch surface layer of dark grayish-brown or grayish-brown very friable cherty silt loam. A very small acreage is severely eroded or has a moderate number of shallow gullies and a few gullies not crossable with farm machinery. The severely eroded areas now have a surface soil of yellowish-brown, friable, cherty silty clay loam.

Bodine cherty silt loam, moderately steep phase, has rapid to very rapid surface runoff and internal drainage. The soil is strongly to very strongly acid and low in organic matter and plant nutrients. Permeability is very rapid throughout, and plant nutrients are rapidly removed by leaching. The water-holding capacity is low to very low. The workability of the soil is very poor because of the moderately steep slopes and chertiness.

Bodine cherty silt loam, sloping phase (Bk) (Capability unit IIIe–2).—This soil differs from Bodine cherty silt loam, moderately steep phase, chiefly in being somewhat deeper to chert beds and in having a somewhat more strongly developed, discontinuous, thin B_2 horizon. An estimated 50 percent of the total acreage has been eroded, and less than 1 percent has been severely eroded. Included are a few acres that are gently sloping.

Bodine cherty silt loam, strongly sloping phase (Bm) (Capability unit IVe–1).—This soil differs from Bodine cherty silt loam, moderately steep phase, chiefly in having a somewhat greater average depth to chert beds and in occurring in smaller areas. In many places the soil is transitional between Mountview soils and steeper Bodine soils. An estimated 50 percent of this soil is eroded, and less than 1 percent is severely eroded. In a fairly large part of the acreage there are a moderate number of shallow gullies, as well as a few deep gullies not crossable with farm machinery.

Bodine cherty silt loam, steep phase (Bo) (Capability unit VIIs–1).—This soil differs from Bodine cherty silt loam, moderately steep phase, chiefly in having a shallower average depth to bedrock. About 40 percent of this soil is eroded, and less than 1 percent is severely eroded.

Bouldery colluvial land

Bouldery colluvial land, strongly sloping phase (Bp) (Capability unit VIIs–1) consists of loose sandstone boulders intermixed with sandstone soil material, all overlying limestone bedrock. Slopes range mostly from 12 to 20 percent.

The boulders are subangular and blocky and range mostly from 2 to 4 feet in diameter. Some are larger, however, and a few are as much as 30 feet in diameter. The soil material around the boulders is a grayish-brown to brown or yellowish-brown very friable fine sandy loam in the upper part and red to brownish-yellow friable clay loam or sandy clay loam in the lower part.

The colluvial accumulation is extremely variable in thickness and in the proportion of boulders and soil material. In some places the colluvium is 30 feet or more in thickness, and in other places limestone bedrock is exposed. The higher parts, especially at the base of the sandstone escarpment, may consist almost entirely of boulders. In other places the soil material may make up 50 percent of the colluvium.

Bouldery colluvial land occurs entirely in the Rockland-Bouldery colluvial land soil association. It is associated with Rockland, moderately steep; Rockland, sloping; and Rock outcrop. It occupies approximately the upper one-fourth of the rough slopes of that part of the Cumberland Mountain between the almost vertical sandstone escarpment and the limestone valleys.

Principally because of the rough and irregular slopes, some included areas have slopes of less than 12 percent or greater than 20 percent. A few small scattered areas contain only a small number of sandstone fragments of boulder size.

All areas of this land are in forest consisting chiefly of oak, hickory, poplar, locust, black walnut, maple, redbud and dogwood. Because it is rough and stony, this land is best used for forest.

Bruno series

The Bruno series consists of excessively drained sandy soils of the bottom lands. They occur on level to gently sloping young alluvium that was washed chiefly from sandstone uplands. Closely associated are the Staser and Sequatchie soils which differ from the Bruno principally in being finer textured, darker colored, less droughty, and more productive. Bruno soils occupy narrow, elongated areas along and adjacent to streams. The Bruno series is represented by only one soil in Coffee County.

Bruno loamy fine sand (Br) (Capability unit IVs–1).—This soil occurs only in the Waynesboro-Cumberland-Hamblen soil association, principally along the Elk River in the vicinity of Rutledge Hill in the southeastern part of the county. Following is a profile description of a forested area:

A_1 0 to 12 inches, pale-brown (10YR 6/3) or light yellowish-brown (10YR 6/4) loose loamy fine sand; structureless (single grain); medium or slightly acid.

C_1 12 to 30 inches, pale-brown (10YR 6/3) or light yellowish-brown (10YR 6/4) to yellowish-brown (10YR 5/4) or brownish-yellow (10YR 6/6) loose or very friable loamy fine sand or fine sandy loam; a few faint, fine, light-brown (7.5YR 6/4) and reddish-yellow (7.5YR 6/6) splotches; medium acid.

C_2 30 inches+, splotched or variegated light yellowish-brown, pale-brown, pale-yellow, white, yellowish-brown, and brownish-yellow stratified beds of sand, fine sandy loam, or loamy fine sand intermixed with gravel.

The surface soil, or A_1 horizon, varies from very pale brown to brown in color and from fine sandy loam to sand in texture. The C_1 horizon varies from light brown to brownish yellow in color, from fine sandy loam to sand in texture, and from 10 to 40 inches in thickness. A few pieces of gravel and a few quartzite pebbles are distributed through the soil, but they are more common in the lower part of the profile.

This soil has very slow surface runoff and very rapid internal drainage. It is low to very low in organic matter and plant nutrients, medium to slightly acid, and low in water-supplying capacity. It has very good workability. In many places floodwater has carried away soil material and produced many overflow channels and a hummocky microrelief. In places the soil receives new sediments from overflow waters.

Included with this soil are a few small widely distributed areas of soil that differs in having more distinct and somewhat more strongly developed layers. This included soil was formerly classified as Sequatchie loamy fine sand, but because of its small acreage and similarity, it was mapped with the Bruno soil.

Practically all of Bruno loamy fine sand is in mixed hardwoods forest of little commercial value. The trees are principally maple, sycamore, red oak, white oak, willow oak, gums, poplar, birch, beech, alder, dogwood, and a few redcedar and walnut. Little of the soil is used for crops and pasture. Many areas once cleared have reverted to forest.

Captina series

The Captina series consists of moderately well drained soils of the low and medium-high stream terraces and of the depressed areas on the medium-high stream terraces. They have formed on level to gently sloping relief from old general alluvium washed from upland soils derived mainly from limestone materials but partly from sandstone materials. They formed under a mixed hardwoods forest.

Captina soils have a dark grayish-brown or yellowish-brown friable to very friable silt loam surface soil. Their subsoil, a friable to firm yellowish-brown to light yellowish-brown silty clay loam, has a compact layer, or fragipan, at a depth of 26 inches.

The alluvial deposit in which the soils were formed varies from 3 to 12 feet in depth. Where the deposit is 3 to 4 feet thick, the C horizon is very thin or absent. The surface soil varies from grayish brown in areas where the alluvial materials have washed from the light-colored soils, such as Bodine and Dickson, to brown or dark brown, where the alluvial materials have washed from Cookeville, Decatur, and Pembroke soils. The B horizon varies from pale yellow to yellowish brown or brown in color and from a friable silty clay loam to firm silty clay in texture. The compact layer or fragipan (B_{3m}) ranges from 6 to 24 inches or more in thickness, and in development it varies from weak to strong. In typical areas the fragipan is discontinuous. Areas of the soil that occur in the Waynesboro-Cumberland-Hamblen soil association contain an appreciable quantity of sand in places; areas along the Duck River and some of the larger creeks throughout the Dickson-Mountview-Lobelville soil association contain many pieces of fine chert gravel.

Captina soils are widely distributed. Although their total acreage is comparatively small, they are locally important to the agriculture of several soil associations.

The Captina soils are associated chiefly with the Humphreys, Taft, and Robertsville soils of the terraces and Lobelville soils of the bottom lands. In position they are similar to the moderately well drained Monongahela and Whitwell soils and the well-drained Sequatchie soils, with which they are associated in some places.

Captina silt loam, gently sloping phase (Cb) (Capability unit IIe–4).—Following is a profile description of this soil in a forested area:

A_{00} and A_0 1 to 0 inch, forest litter and leaf mold.

A_1 0 to 1 inch, dark grayish-brown (10YR 4/2) very friable silt loam; weak fine crumb structure; stained dark with organic matter; strongly acid.

A_2 1 to 8 inches, brown (10YR 5/3) or yellowish-brown (10YR 5/4) friable silt loam; moderate fine granular structure; strongly acid.

B_1 8 to 13 inches, yellowish-brown (10YR 5/4) or light yellowish-brown (10YR 6/4) friable silty clay loam; weak to moderate fine subangular blocky structure; patchy clay skins; strongly acid.

B_2 13 to 22 inches, yellowish-brown (10YR 5/4 to 5/6) friable to firm silty clay loam showing a few fine, faint, brownish-yellow (10YR 6/6) and light brownish-gray (10YR 6/2) variegations; moderate fine subangular blocky structure; patchy clay skins; a few soft black concretions and finely divided, rounded fragments of chert gravel; strongly acid or medium acid.

B_3 22 to 26 inches, light yellowish-brown (10YR 6/4) or yellowish-brown (10YR 5/4) firm silty clay loam; moderate number of fine, distinct, pale-yellow (2.5Y 7/4) or yellow (2.5Y 7/6) and light brownish-gray (10YR 6/2) or light-gray (10YR 7/1) mottles; moderate fine to medium subangular blocky structure; patchy clay skins; a few soft, black concretions and segregations and a few small, rounded fragments of chert; strongly acid or medium acid.

B_{3m} 26 to 38 inches, mottled yellowish-brown (10YR 5/6), brownish-yellow (10YR 6/6), and light-gray (10YR 7/1 or 7/2) firm silty clay loam; mottles distinct, many, and medium in size; material compact in place but breaks to moderate medium blocky structure when dug out; patchy clay skins; many soft, black concretions and segregations, a few small pieces of chert gravel and an occasional quartzite pebble; strongly acid.

C 38 inches+, mottled yellowish-brown (10YR 5/6), light-gray (10YR 7/1), and strong-brown (7.5YR 5/6) firm silty clay loam or silty clay; many, medium, prominent mottles; a few prominent, fine, yellowish-red (5YR 4/6) or red (2.5YR 4/6) mottles; moderate medium to coarse blocky structure; a few to a moderate number of rounded chert fragments; gravel beds commonly at base of deposit; profile underlain by limestone residuum at depths of 3½ to 10 feet or more.

Included are areas of soil that differ in not having a fragipan (B_{3m}). This soil was formerly classified as Capshaw soil. Also, in a small included acreage, the surface soil is a loam. Another inclusion is a very small acreage of severely eroded, gently sloping to sloping soil. This severely eroded soil has a friable, light silty clay loam surface soil in most places.

Captina silt loam, gently sloping phase, has slow to medium surface runoff and internal drainage. Permeability is moderate in the surface soil. It is moderately slow in the subsoil and restricts growth of plant roots. The soil is strongly acid to medium acid, low in organic matter, low to medium in plant nutrients, and moderate in water-supplying capacity. Part of the soil is subject to flooding in periods of high rainfall, but usually it is flooded for only a short time. The flooded areas are scoured by overflow water, especially along the overflow channels. The soil has very good workability and is easy to keep in good tilth. The hazard of erosion is slight to moderate.

An estimated 50 percent of this soil has been cleared and is used for crops. In these cleared areas the A_{00}, A_0, and A_1 horizons have been mixed with the A_2 horizon in the plow layer and have lost their original characteristics.

Captina silt loam, eroded gently sloping phase (Cc) (Capability unit IIe–4).—This soil differs from Captina silt loam, gently sloping phase, chiefly in having an eroded, dark grayish-brown or brown surface soil 6 to 8 inches in thickness. A small acreage of gently sloping to sloping severely eroded soil is included. This inclusion has a brown or yellowish-brown friable silty clay loam surface soil.

Captina silt loam, level phase (Ca) (Capability unit IIe–4).—This soil differs from Captina silt loam, gently sloping phase, chiefly in having a somewhat thicker A horizon, a more uniformly developed and more continuous fragipan layer, slower surface runoff, and a generally higher fluctuating water table. In a considerable acreage, drainage of this soil is transitional to that of the some-

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what poorly drained Taft soil. A few small areas of Taft soil are included; these were too small to map or farm separately.

Colbert series

The Colbert soils have formed over argillaceous (clayey) limestone. They have a grayish-brown to dark grayish-brown surface soil. Their subsoil is firm silty clay, brownish yellow, olive brown, or a light olive brown in the upper part, and mottled in the lower part. The soils are very rocky and shallow to bedrock. They are somewhat poorly drained to moderately well drained.

The Colbert soils are not mapped as separate units but are mapped in undifferentiated soil groups with Mimosa and Baxter soils. The Colbert profile is described in the mapping unit of Mimosa, Baxter, and Colbert very rocky soils, strongly sloping phases.

Cookeville series

The Cookeville series consists of well-drained soils on uplands that were derived from residual material from moderately high grade limestone. The soils have formed under a mixed hardwoods forest on gently sloping to strongly sloping ridge-and-karst relief.

Cookeville soils have a dark grayish-brown to yellowish-brown, brown, reddish-brown, or a dark-red very friable to firm surface soil. The subsoil is reddish-brown or a yellowish-red to red or dark-red friable or firm silty clay loam or silty clay.

On the broader and smoother slopes a thin discontinuous layer of loesslike silt is a component of the upper part of the solum. Other variations are chiefly in the combined thickness of A and B_1 horizons, which ranges from 12 to 28 inches in depth and varies in chert content and in the consistence and texture of the B_2 horizon. The B_2 horizon ranges from a friable silty clay loam to a firm silty clay. Areas having a thicker loesslike silty layer commonly have a friable silty clay loam B_{21} or B_2 horizon and a firm silty clay B_{22} or relic B_2 horizon. The chert content varies considerably. In many places, especially on the smoother landscapes, the upper profile may be practically free of chert, whereas on the steeper and more exposed slopes finely divided chert fragments are distributed throughout the profile.

The Cookeville soils occur in small and medium-sized areas widely distributed throughout the Highland Rim section of the county. They are most extensive in the Mountview-Cookeville-Pembroke, the Cookeville-Cumberland-Hermitage, and the Mountview-Baxter-Lobelville soil associations. Cookeville soils are important to the agriculture of the county.

Cookeville soils are associated chiefly with the Mountview, Dickson, Baxter, Pembroke, and Decatur soils. They are smoother and contain less chert than the Baxter soils, and they differ from the Mountview soils in having a browner surface soil and generally a redder subsoil. In comparison with the Pembroke soils, they have a less brown surface soil, a less friable subsoil, and less productivity. Also, they contain chert, whereas the Pembroke soils are chert free. They have a lighter colored surface soil than the Decatur soils and a subsoil that is not so red or firm a clay.

Cookeville silt loam, gently sloping phase (Cd) (Capability unit IIe–1).—A profile of this soil in a forested area is as follows:

A_{00} and A_0 1 to 0 inch, forest litter and leaf mold; range in thickness, 0 to 1½ inches.

A_1 0 to 1 inch, dark grayish-brown (10YR 4/2) very friable silt loam stained with dark gray (10YR 4/1) and very dark grayish brown (10YR 3/2); weak fine crumb structure.

A_2 1 to 7 inches, yellowish-brown (10YR 5/4) or brown (10YR 4/3) or (7.5YR 4/4) very friable silt loam; weak fine granular structure or very fine subangular blocky structure; range in thickness, 5 to 9 inches.

A_3 7 to 10 inches, brown (7.5YR 4/4) or reddish-brown (5YR 4/4) friable silt loam; weak very fine or fine subangular blocky structure.

B_1 10 to 16 inches, reddish-brown (5YR 4/4) or yellowish-red (5YR 4/6, 5/6, or 5/8) friable silty clay loam; a few, fine, faint, strong-brown (7.5YR 5/6) and yellowish-brown (10YR 5/4) variegations; weak to moderate subangular blocky and blocky structure; a few patchy clay skins and a few finely divided chert fragments; range in thickness, 4 to 12 inches.

B_2 16 to 36 inches, red (2.5YR 4/6) or dark-red (2.5YR 3/6) friable to firm silty clay loam or silty clay; a few fine, faint, pale-brown (10YR 6/3) and yellowish-brown (10YR 5/4) variegations; moderate to strong fine and medium blocky structure; continuous clay skins; a few to moderate number of finely divided chert fragments and a few black concretions 1 to 2 millimeters in diameter; range in thickness, 15 to 25 inches.

B_3 36 to 45 inches, red (2.5YR 4/6) or dark-red (2.5YR 3/6) firm silty clay; a moderate number of fine, prominent, strong-brown (7.5YR 5/6) and brownish-yellow (10YR 6/6) variegations and a few fine, prominent, light brownish-gray (10YR 6/2) or pale-brown (10YR 6/3) variegations; moderate or strong fine and medium blocky structure; continuous clay skins; a moderate number of finely divided chert fragments; range in thickness, 6 to 15 inches.

C 45 to 60 inches +, red (2.5YR 4/6) or dark-red (2.5YR 3/6) very firm cherty silty clay or clay; a moderate number of medium, prominent, strong-brown (7.5YR 5/6), light yellowish-brown (10YR 6/4), and brownish-yellow (10YR 6/6) variegations and a few, fine, prominent, light brownish-gray (10YR 6/2) variegations; moderate medium blocky structure; bedrock at 6 to 12 feet.

Included with this soil are small acreages in the Dickson-Mountview-Lobelville and the Mountview-Cookeville-Pembroke soil associations that differ chiefly in having strong-brown B_1 and upper B_2 horizons. In the Waynesboro-Cumberland-Hamblen soil association many areas have a thin discontinuous layer consisting of old high stream-terrace material or old valley fill material. These materials range from silt loam to loam in texture and from 6 to 15 inches in thickness.

Surface runoff and internal drainage of Cookeville silt loam, gently sloping phase, are medium. Permeability is moderate in the surface soil and moderately slow in the subsoil. The soil is medium to strongly acid, medium in plant nutrients, and moderate in organic matter and water-supplying capacity. It has very good workability. The hazard of erosion is moderate.

Cookeville silt loam, eroded gently sloping phase (Ce) (Capability unit IIe–1).—This soil differs from Cookeville silt loam, gently sloping phase, chiefly in having a brown or yellowish-brown very friable surface soil.

Cookeville silt loam, sloping phase (Cf) (Capability unit IIIe–1).—This soil differs from Cookeville silt loam, gently sloping phase, chiefly in depth to bedrock. It generally averages slightly less deep to rock and has a wider range in depth. In the shallower parts the soil is notably more cherty than elsewhere, and in texture and color it resembles Baxter cherty silt loam, sloping phase.

Cookeville silt loam, sloping phase, has rapid surface runoff. The erosion hazard is moderate to high. The soil has good workability and a wide range in suitability for use.

Cookeville silt loam, eroded sloping phase (Cg) (Capability unit IIIe-1).—This soil differs from Cookeville silt loam, gently sloping phase, chiefly in the color and texture of its surface layer. The surface soil, or plow layer, is mostly brown or yellowish-brown silt loam, but in a few spots it is reddish-brown or yellowish-red to dark-red silty clay loam.

Cookeville silty clay loam, severely eroded gently sloping phase (Ck) (Capability unit IIIe-1).—This soil differs from Cookeville silt loam, gently sloping phase, chiefly in color of its surface soil. The color pattern is brown, yellowish red, and dark red, with the reddish colors predominating. Because of its firmer consistence, lower water-supplying capacity and organic-matter content, and poorer tilth, this soil is less productive and less well suited to intertilled crops than Cookeville silt loam, gently sloping phase.

Figure 6.—**Sericea lespedeza on Cookeville silty clay loam, severely eroded sloping phase.**

Cookeville silty clay loam, severely eroded sloping phase (Cm) (Capability unit IIIe-1).—This soil differs from Cookeville silt loam, gently sloping phase, chiefly in the color of its surface soil and in having stronger slopes. Typical areas have a color pattern of brown, yellowish red, and dark red, with the reddish colors predominating. Because of its rapid surface runoff, moderately low water-supplying capacity, poor tilth, firm consistence, and high erosion hazard, this soil is poorly suited to intertilled crops, but other crops can be grown (fig. 6).

Cookeville silty clay loam, severely eroded strongly sloping phase (Ch, Co) (Capability unit VIe-1).—This soil differs from Cookeville silt loam, gently sloping phase, chiefly in color and consistence of its surface and in having stronger slopes. Typically, an area of soil has a color pattern of brown, reddish brown or yellowish red, and dark red, but the reddish colors are dominant. A few shallow gullies have formed. Because of the rapid surface runoff, moderately low water-supplying capacity, firm consistence, poor tilth, and high erosion hazard, this soil is poorly suited to intertilled crops. Included with this soil are eroded, strongly sloping areas of Cookeville silt loam.

Cookeville silty clay loam, gullied sloping phase (Cn) (Capability unit VIe-1).—This soil differs from Cookeville silt loam, gently sloping phase, in that it has a network of predominantly shallow gullies. There are a few deep gullies that greatly hamper normal tillage or make it impractical. The areas between gullies vary considerably in color, texture, and consistence, depending on which layer of the original soil is presently exposed. The total acreage of this phase is about 160 acres. The individual areas are small and widely separated. Practically all areas are idle and support little or no vegetation. Pines have been planted in a few areas.

Cumberland series

The Cumberland series consists of deep, well-drained soils on high stream terraces. They have formed in alluvium washed from soils of uplands that were derived mainly from limestone residuum. Generally the alluvium contains some sandy material.

Cumberland soils have a dark-brown to dark reddish-brown friable silt to silty clay loam surface soil. The subsoil is dark reddish-brown friable silty clay loam to dark-red or dusky-red friable to firm silty clay or clay.

The depth of the alluvial deposit in which the soils have formed ranges from 2 to 15 feet. Most of the soil, however, has depths between 4 and 8 feet. The surface soil varies from loam to silty clay loam, and the subsoil, from silty clay loam to clay loam to clay. The B horizon varies from friable to very firm, but in most places it is friable to firm. Where the deposit is 4 feet or less in depth, the B_3 and C horizons are very thin or are absent. In many areas the soil contains a notable quantity of chert gravel and angular chert fragments. The chert apparently is either old valley fill derived through geologic erosion of Cumberland escarpment or old alluvium carried only a short distance.

Cumberland soils are gently sloping to sloping but in places have a karst type of relief. They are extensive and agriculturally important in the Waynesboro-Cumberland-Hamblen and the Cookeville-Cumberland-Hermitage soil associations. Small acreages are in other soil associations.

The Cumberland soils are associated chiefly with the Waynesboro and Etowah soils of the terrace lands and the Decatur and Cookeville soils of the uplands. They are also associated with the Sequatchie, Whitwell, Captina, Taft, Hermitage, and Emory soils.

The Cumberland soils have formed from alluvium that originated largely from limestone, whereas Waynesboro soils have formed from alluvium that originated largely from sandstone. The Cumberland soils are finer textured, firmer, redder throughout, and more fertile than the Waynesboro soils. The Cumberland soils have a browner surface soil and redder B and C horizon than Etowah soils. They are similar to the Decatur soils in color but have a less firm, less fine textured, and less plastic B horizon.

Cumberland silt loam, eroded gently sloping phase (Cr) (Capability unit IIe-1).—The following describes a profile of this soil in a cultivated area:

A_p 0 to 7 inches, dark-brown (7.5YR 3/2) or dark reddish-brown (5YR 3/3) friable heavy silt loam; weak to moderate fine crumb or granular structure; range in thickness, 4 to 8 inches.

A_3 7 to 12 inches, dark reddish-brown (5YR 3/4) friable light silty clay loam; moderate fine granular or weak very fine subangular blocky structure; contains a few soft black concretions 1.0 millimeter in diameter and some quartzite pebbles 2.0 millimeters in diameter; 3 to 9 inches in thickness.

B_1 12 to 20 inches, dark reddish-brown (2.5YR 3/4) friable heavy silty clay loam; weak to moderate fine subangular blocky structure; patchy clay skins; a few black concretions 1.0 millimeter in diameter and an occasional small quartzite pebble; range in thickness, 5 to 12 inches.

B_2 20 to 60 inches, dark-red (2.5YR 3/6 or 10R 3/6), dark reddish-brown (2.5YR 3/4), or dusky-red (10R 3/4) friable to firm silty clay or clay; strong coarse blocky structure that breaks fairly readily into strong fine blocky peds; continuous clay skins and a moderate number of black concretions and segregations 1 to 2 millimeters in diameter; contains an occasional quartzite pebble or pieces of quartz gravel 1.0 to 5.0 millimeters in d ameter; range in thickness, 18 to 48 inches.

B_3 60 to 85 inches, dark-red (2.5YR 3/6 or 10R 3/6) or dusky-red (10R 3/4) friable to firm clay or silty clay; a few, fine, prominent, gray (10YR 5/1), pale-brown (10YR 6/3), and brown (7.5YR 5/4) variegations; enough coarse and medium sand to give the soil a gritty feel; moderate coarse blocky structure that breaks fairly easily into fine blocky peds; continuous clay skins that are somewhat thinner and less prominent than in overlying horizons; a few quartzite pebbles and an occasional piece of chert gravel 2.0 to 5.0 millimeters in diameter; range in thickness, 12 to 30 inches.

C 85 to 96 inches +, dark-red (2.5YR 3/6) or red (2.5YR 4/6) firm clay, silty clay, or clay loam; a moderate number of fine to medium, prominent, yellowish-brown, gray, and brown variegations; moderate medium or coarse blocky structure; a few to many quartzite pebbles 2.0 to 5.0 millimeters in diameter and pieces of chert gravel ½ to 3 inches in diameter.

A few small severely eroded spots occur and are conspicuous because they consist of exposures of dark reddish-brown and dark-red subsoil. These small included spots have a silty clay loam texture and a somewhat firmer consistence than that in the soil described. In many places there is no recognizable A_3 horizon because of severe erosion and the subsequent mixing of subsoil material in the plow layer.

Cumberland silt loam, eroded gently sloping phase, has medium surface runoff and medium internal drainage. Permeability is moderate in the surface soil and moderately slow in the subsoil. The soil has a high water-supplying capacity. It is moderate to moderately high in organic matter, medium to high in plant nutrients, and medium to strongly acid in reaction. It has very good workability, and good tilth is easy to maintain. The hazard of erosion is moderate.

Cumberland silt loam, gently sloping phase (Cp) (Capability unit IIe–1).—This soil differs from Cumberland silt loam, eroded gently sloping phase, chiefly in having a thicker surface soil that is predominantly dark brown. In most areas the surface soil ranges from 12 to 16 inches in thickness. This soil further differs in having prevailingly smoother slopes that average somewhat less in gradient. The slopes generally range from 2 to 5 percent, and a few areas are slightly less than 2 percent.

Practically all areas have been cleared of the original hardwoods forest and are used for crops. The very small remaining part is in forest consisting chiefly of oak, hickory, and poplar, with scatterings of walnut, cedar, dogwood, and locust.

Cumberland silt loam, eroded sloping phase (Cs) (Capability unit IIIe–1).—This soil differs from Cumberland silt loam, eroded gently sloping phase, mainly in having a greater range in depth and, on the average, somewhat less depth. It is also more variable in the color, texture, and thickness of its surface layer because it has lost more soil through erosion. Included is a small acreage that remains in mixed hardwoods forest and is uneroded or only slightly eroded.

Cumberland silty clay loam, severely eroded gently sloping phase (Ct) (Capability unit IIIe–1).—This soil differs from Cumberland silt loam, eroded gently sloping phase, chiefly in having a generally redder and finer textured surface soil. The present surface soil is dark reddish-brown silty clay loam in most places, but there are small areas of dark-brown silt loam and of dark reddish-brown to dark-red silty clay or clay.

This severely eroded soil is less suited to cultivated crops and less productive than Cumberland silt loam, eroded gently sloping phase. It is less desirable because it has more rapid surface runoff, a lower supply of plant nutrients and organic matter, less capacity to supply water, poorer tilth, and more severe erosion.

Cumberland silty clay loam, severely eroded sloping phase (Cu) (Capability unit IIIe–1).—This soil differs from Cumberland silt loam, eroded gently sloping phase, chiefly in having stronger slopes and a redder and firmer surface soil. This severely eroded soil is poorly suited to intertilled crops, largely because of its sloping relief, rapid surface runoff, poor tilth, very low organic-matter content, low water-supplying capacity, and high erosion hazard.

Included with this soil are a few small areas having a number of gullies. The gullies generally are numerous enough or deep enough to hamper tillage or to make it impractical.

Decatur series

The Decatur series consists of very deep, well-drained, reddish soils of the uplands. They have developed in residuum from high-grade St. Louis limestone. They are predominantly sloping to gently sloping.

Decatur soils have a dark reddish-brown to dark-brown or dark-red friable silty clay loam to very firm clay or clay loam surface soil. The subsoil is dark reddish-brown to dark-red or dusky-red firm silty clay loam to very firm clay.

On the smoother parts the surface soil is somewhat thicker and consists of a dark-brown silt loam. The more eroded and more sloping areas commonly contain more of the finely divided chert fragments, have a wider range in depth, and, on the average, have less depth to bedrock.

The Decatur soils occupy a comparatively small acreage. They are most extensive in the Mountview-Cookeville-Pembroke and the Cookeville-Cumberland-Hermitage soil associations, but small acreages are in other soil associations.

Decatur soils are intricately associated with the Cookeville, Pembroke, Cumberland, Baxter, Hermitage, and Emory soils. They differ from the Cookeville soils chiefly in being firmer, finer textured, redder, less cherty throughout, and inherently more fertile. They have a more firm subsoil than the Pembroke soil. Decatur soils resemble the Cumberland soils in general appearance but differ chiefly in parent material and in having a firmer consistence.

Decatur silty clay loam, eroded gently sloping phase (Db) (Capability unit IIe–1).—The profile of this soil in a cultivated area shows the following characteristics:

- A_p 0 to 6 inches, dark reddish-brown (5YR 3/3), reddish-brown (5YR 4/4), or dark-brown (7.5YR 3/2) friable silty clay loam; moderate fine granular structure or weak very fine subangular blocky structure; range in thickness, 4 to 8 inches.
- B_1 6 to 14 inches, dark reddish-brown (2.5YR 3/4) or dark-red (2.5YR 3/6) firm silty clay or silty clay loam; moderate fine to medium subangular blocky and blocky structure; patchy clay skins and a few black concretions; range in thickness, 4 to 10 inches.
- B_2 14 to 48 inches, dark reddish-brown (2.5YR 3/4), dark-red (10R 3/6), or dusky-red (10R 3/4) very firm clay; strong medium blocky structure; continuous clay skins; a moderate number of ferromanganese concretions 1.0 to 2.0 millimeters in diameter and a few chert fragments ½ to 2 inches in diameter; range in thickness, 24 to 40 inches.
- B_3 48 to 66 inches, dark-red (2.5YR 3/6 or 10R 3/6) very firm clay; a moderate number of fine to medium, prominent, yellowish-brown (10YR 5/6) or brownish-yellow (10YR 6/6) and pale-brown (10YR 6/3) variegations; strong medium blocky structure; continuous clay skins; a moderate number of chert fragments ½ to 2 inches in diameter and a few to a moderate number of black concretions 1.0 to 2.0 millimeters in diameter; range in thickness, 8 to 24 inches.

In about 90 acres this soil has a firm to very firm dark reddish-brown or dark-red silty clay surface soil, and in about 6 acres it has an undisturbed, friable dark-brown surface soil somewhat thicker than normal. Also included are a few areas of soil in which part of the upper solum has developed in old alluvial material deposited on stream terraces.

Decatur silty clay loam, eroded gently sloping phase, has slow to medium surface runoff and medium internal drainage. The soil is medium to strongly acid, medium to high in plant nutrients, moderate in organic matter, and high in water-supplying capacity. Permeability is moderate in the surface soil and moderately slow in the subsoil. Workability is good. The hazard of erosion is moderate.

Decatur silty clay, severely eroded sloping phase (Da) (Capability unit IIIe–1).—This soil differs from Decatur silty clay loam, eroded gently sloping phase, in having stronger slopes and a finer textured and generally redder surface soil. It further differs in having somewhat less depth to bedrock and a higher content of fine, angular chert fragments.

The surface soil varies considerably in color, consistence, and texture. Within short distances it ranges from a reddish-brown friable silty clay loam to a dark-red, firm or very firm silty clay or clay. In some areas numerous shallow gullies have developed, and many of them cannot be filled by tillage. Some included areas are strongly sloping.

This severely eroded soil is poor for intertilled crops because of its fine-textured surface soil, rapid surface runoff, low water-supplying capacity, very low organic-matter content, poor tilth, and susceptibility to further erosion.

Dellrose series

The Dellrose series consists of cherty, shallow to very deep, well drained to somewhat excessively drained soils. They are on colluvium accumulated on slopes leading down from the Highland Rim to the Central Basin. The colluvium weathered chiefly from cherty limestone. Materials and seepage water from the underlying phosphatic limestone residuum apparently have contributed phosphorus to these soils.

The Dellrose soils have a dark-brown to brown or yellowish-red cherty surface soil and a brown to reddish-brown or yellowish-red cherty subsoil.

On the more convex slopes or exposed slopes, the colluvial material may be no more than 2 feet thick and the subsoil is generally yellowish red. On the concave slopes, especially at the heads of hollows, the soil may be brown to depths of 24 to 30 inches and the accumulated material may be 12 feet or more thick. The color of the subsoil is quite variable from place to place and includes brown, strong brown, reddish brown, and yellowish red. In undisturbed forested areas the upper 1 or 2 inches is very dark brown and the thickness of the A horizon ranges from 12 to 18 inches.

Dellrose soils are on strong to steep slopes in the Bodine-Dellrose soil association. They are moderately extensive and important to the agriculture of this association. About 20 percent of their acreage is in forest consisting of poplar, beech, walnut, locust, hackberry, hickory, and red and white oaks. About 75 percent of the Dellrose acreage is eroded, and about 5 percent is severely eroded.

Dellrose soils are associated with the Bodine, Mimosa, Pace, and Armour soils. They are darker colored, deeper, and at lower elevations than Bodine soils. They are on higher slopes than the Mimosa soils and have a less well-developed profile. Their profile is not so well developed as that of the Pace and Armour soils, and they are at higher elevations.

Dellrose cherty silt loam, moderately steep phase (Dd) (Capability unit VIe-2).—The following describes a profile of this soil in a cultivated area:

- A_p 0 to 8 inches, dark-brown (10YR 3/3) friable cherty silt loam; weak fine granular structure; chert fragments mostly 1 to 6 inches in diameter; medium to strongly acid; range in thickness, 4 to 10 inches.
- A_3 8 to 14 inches, brown (7.5YR 4/4 or 10YR 4/3) friable cherty silt loam; weak fine granular to weak fine subangular blocky structure; contains an occasional black concretion 0.5 to 1.0 millimeter in diameter; medium to strongly acid; range in thickness, 2 to 9 inches.
- B_1 14 to 22 inches, brown (7.5YR 4/4), strong-brown (7.5YR 5/6), or reddish-brown (5YR 4/4) friable, cherty, light silty clay loam or heavy silty loam; weak to moderate fine subangular blocky or blocky structure; patchy yellowish-red (5YR 5/6) clay skins; a moderate number of black concretions and segregations 1.0 millimeter in diameter; medium to strongly acid.
- B_2 22 to 48 inches, yellowish-red (5YR 5/6) friable cherty silty clay loam; a few, medium, distinct, yellowish-brown (10YR 5/4) or light yellowish-brown (10YR 6/4) variegations; material strong brown (7.5YR 5/6) when crushed; moderate fine to medium subangular blocky or blocky structure; continuous clay skins; a moderate number of black concretions and stains 1.0 millimeter in diameter; an occasional small piece of partly weathered black and greenish shale; medium to strongly acid; range in thickness, 12 to 42 inches.
- B_3 48 to 65 inches, yellowish-red (5YR 5/6) friable to firm silty clay loam; many, fine, faint to distinct, strong-brown (7.5YR 5/6) and light yellowish-brown (10YR 6/4) variegations and a few fine, prominent, light brownish-gray (10YR 6/2) variegations; moderate to medium blocky structure; a moderate number of black concretions 1.0 millimeter in diameter and an occasional small piece of partly weathered black or greenish shale; distinct clay skins on vertical faces of structure peds and a few patchy clay skins on horizontal faces; underlain by residuum of weathered phosphatic

argillaceous limestone; range in thickness, 6 to 24 inches.

Surface runoff is rapid and internal drainage is medium. The soil is medium to strongly acid and moderate in content of organic matter. It is medium to high in plant nutrients, although the content at any point depends to a considerable extent on the amount of the original surface soil that has been lost through erosion. Permeability is moderately rapid in the surface soil and moderate in the subsoil. The water-supplying capacity is high. Workability is poor because of the steepness and the chertiness of the soil. The risk of erosion is high.

Dellrose cherty silt loam, eroded strongly sloping phase (Dc) (Capability unit IVe-1).—This soil differs from Dellrose cherty silt loam, moderately steep phase, chiefly in having less strong slopes and in being eroded. It further differs in having less rapid surface runoff, less risk of erosion, and better workability.

Included are a few small areas that are sloping (5 to 12 percent slopes) and a few other small areas that are uneroded or only slightly eroded.

Dellrose cherty silt loam, steep phase (De) (Capability unit VIe-2).—This soil differs from Dellrose cherty silt loam, moderately steep phase, chiefly in the depth of the colluvial material in which it has formed. For this soil, the depth to the underlying residual material ranges mostly between 2 and 5 feet. The surface soil varies greatly in thickness because of differences in degree of erosion. The different degrees of erosion were not mapped separately, because on slopes this steep they were not significant in management.

About 54 percent of this soil is eroded, 26 percent is uneroded or only slightly eroded, and 20 percent is severely eroded. The severely eroded areas have a surface soil of cherty silty clay loam and contain a few shallow gullies and an occasional deep gully.

Dellrose cherty silty clay loam, severely eroded moderately steep phase (Dg) (Capability unit VIe-2).—This soil differs from Dellrose cherty silt loam, moderately steep phase, in having a somewhat firmer and more cherty, brown to yellowish-red surface soil and less depth to the firm, fine-textured underlying residual material. It also differs in containing a few shallow gullies and an occasional deep gully. Included with this soil are a few small areas having gullies that are deep enough and numerous enough to prohibit or greatly hamper use of farm machinery.

Dellrose cherty silty clay loam, severely eroded strongly sloping phase (Df) (Capability unit VIe-1).—This soil differs from Dellrose cherty silt loam, moderately steep phase, chiefly in having a somewhat thinner and firmer surface soil that varies more in color. The present surface soil ranges from dark brown to brown or yellowish red.

This severely eroded strongly sloping soil further differs from the moderately steep phase in having more chert on the surface, as well as a few shallow gullies and an occasional deep gully that cannot be crossed with farm machinery.

Dickson series

The Dickson series consists of moderately well drained soils of uplands. Their parent material is a thin silty mantle that overlies residuum weathered from cherty limestone. The silty mantle either was windblown or it weathered from a relatively chert free stratum of limestone.

Dickson soils have a dark-gray to light yellowish-brown very friable silt loam surface soil. The upper part of their subsoil is yellowish-brown or light yellowish-brown friable silt loam to silty clay loam. A brittle siltpan, or fragipan, is the most conspicuous feature of the Dickson soils. It occurs at depths of 24 to 36 inches.

The fragipan (B_{3m}) varies from weakly to strongly developed and from 6 to 24 inches in thickness. It is most frequently at depths of 26 to 28 inches, though the range is from 23 to 36 inches. Locally the B_1 and B_2 horizons vary from brown to light olive brown. The soil is relatively free of chert, but in places finely divided chert fragments are distributed through the solum. In disturbed areas the surface soil is dark grayish brown or grayish brown to depths of 6 to 8 inches.

Dickson soils are the most extensive in the county. They occupy a very large acreage in the Dickson-Mountview-Lobelville soil association and small acreages in the Mountview-Cookeville-Pembroke and the Mountview-Baxter-Lobelville soil associations. An estimated 50 percent of the Dickson acreage is uneroded or only slightly eroded, and the other 50 percent is eroded. In the forested areas the trees are red, white, post, and blackjack oaks.

Dickson soils are associated with the Baxter, Mountview, Sango, Lawrence, and Guthrie soils. They resemble Mountview soils in color, texture, and consistence; they differ chiefly in being less well drained and having a distinct fragipan. The Dickson soils are somewhat darker colored and thicker to the fragipan than the Sango soil. The Dickson soils occupy gently sloping areas, and the Sango soil is in level areas. These soils have a less gray surface soil than the Lawrence and Guthrie soils. The Dickson soils are mottled in the lower layers of the subsoil, but the Lawrence and Guthrie are mottled throughout the subsoil.

Dickson silt loam, gently sloping phase (Dh) (Capability unit IIe-4).—Following is a description of a profile of this soil in a forested area:

A_{00} and A_0 1 to 0 inch, forest litter and leaf mold; range in thickness, 0 to 1 inch.

A_1 0 to 1 inch, dark-gray (10YR 4/1) or gray (10YR 5/1) very friable silt loam; weak fine crumb structure; strongly or very strongly acid; range in thickness, ½ to 2 inches.

A_2 1 to 6 inches, pale-brown (10YR 6/3) or light yellowish-brown (10YR 6/4) very friable silt loam; weak fine granular and subangular blocky structure; strongly or very strongly acid; range in thickness, 4 to 7 inches.

A_3 6 to 9 inches, light yellowish-brown (10YR 6/4) very friable silt loam; weak very fine or fine subangular blocky structure; strongly or very strongly acid; range in thickness, 2 to 5 inches.

B_1 9 to 12 inches, yellowish-brown (10YR 5/4) or light yellowish-brown (10YR 6/4) friable silt loam or light silty clay loam; weak fine and medium subangular blocky structure; strongly or very strongly acid; range in thickness, 3 to 10 inches.

B_2 12 to 23 inches, yellowish-brown (10YR 5/4) or light yellowish-brown (10YR 6/4) friable, heavy silt loam or light silty clay loam; moderate fine or medium subangular blocky structure; contains a few soft, brownish concretions and finely divided chert fragments; strongly or very strongly acid; range in thickness, 6 to 18 inches.

B_3 23 to 27 inches, yellowish-brown (10YR 5/4) or light yellowish-brown (10YR 6/4) friable silty clay loam; moderate number of fine, faint or distinct, light brownish-gray (2.5Y 6/2) or light-gray (10YR 7/1) and brownish-yellow (10YR 6/6) mottles; moderate fine to medium blocky structure; contains a few soft, brownish concretions and finely divided chert fragments; strongly acid; range in thickness, 1 to 6 inches.

B_{3m} 27 to 48 inches, mottled light yellowish-brown (10YR 6/4), yellowish-brown (10YR 5/6), gray (10YR 6/1), light brownish-gray (2.5Y 6/2), strong-brown (7.5YR 5/6), and red (2.5YR 4/6) heavy silt loam or light silty clay loam; firm and compact in place, but brittle and friable when crushed; many, medium, distinct mottles; weak to moderate medium or coarse blocky structure; contains a few seams of gray silty clay loam that extend into layer below; a few to a moderate number of brown and black concretions and light-colored fine chert fragments; strongly acid; range in thickness, 6 to 24 inches.

B_{2b} 48 to 54 inches +, mottled yellowish-red (5YR 4/6), red (2.5YR 4/6), yellowish-brown (10YR 5/6), light yellowish-brown (10YR 6/4), gray (10YR 6/1), and brownish-yellow (10YR 6/6) or strong-brown (7.5YR 5/6) firm cherty silty clay loam; mottles prominent, many, and fine.

Owing to similarity in profile and difficulty in delineation on the map, small areas of Sango and Mountview soils are included with this soil. Also, in about 10 acres, the slopes are stronger and range from 5 to 8 percent.

Surface runoff is slow to medium, and internal drainage is medium to slow. Permeability is moderate in the surface soil. It is moderately slow in the subsoil, and the fragipan restricts growth of plant roots. The soil is strongly to very strongly acid, moderate in water-supplying capacity, and low in plant nutrients and organic matter. It has excellent workability, and good tilth is easily maintained. The risk of erosion is slight to moderate.

Dickson silt loam, eroded gently sloping phase (Dk) (Capability unit IIe-4).—This soil differs from Dickson silt loam, gently sloping phase, in having a grayish-brown to yellowish-brown surface soil to an average depth of 6 inches. In a few small included areas the soil is severely eroded and is more strongly sloping (5 to 8 percent). This severely eroded soil has a surface soil of yellowish-brown friable silty clay loam or heavy silt loam. Figure 7 shows an area of Dickson silt loam, eroded gently sloping phase, that has been planted to pine.

Dunning series

The Dunning series consists of dark-colored somewhat poorly drained soils on recent alluvium. This alluvium has washed mostly from soils derived from argillaceous limestone residuum. These soils are on level flood plains along perennial and intermittent drainageways. Locally, they have formed from slope wash.

The Dunning soils are dark colored, almost black, and somewhat poorly drained. They have a friable to firm silt loam or silty clay loam surface soil, a firm to very firm silty clay or clay subsoil, and an underlying layer of silty clay or sandy clay.

The soils vary mostly in thickness of layers and, below a depth of 30 inches, in texture, consistence, and amount of mottling. Below that depth the soil material ranges from sandy clay loam through sandy clay to clay. In the stratified layers, the texture is dominantly silty clay to clay. Near streams the deeper part of the profile contains appreciable amounts of slightly plastic or plastic sandy clay or sandy clay loam. In contrast, on the outer boundary of the flood plain, the soil is distinctly mottled plastic or very plastic clay in the lower part of the profile.

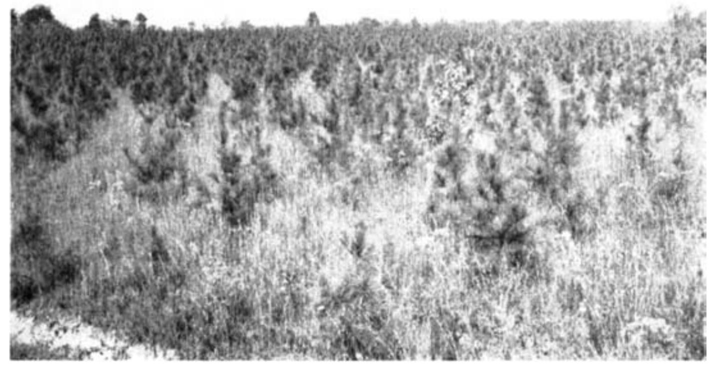

***Figure 7.*—Four-year old stand of loblolly pine on Dickson silt loam, eroded gently sloping phase.**

A few small quartzite pebbles are in the upper part of the profile, but they are more numerous in the lower part of the subsoil. A few small depressed areas or seepage spots in these soils stay wet most of the time.

The Dunning soils are limited in extent but are of local agricultural importance. The principal areas are in the Dickson-Mountview-Lobelville, the Mountview-Baxter-Lobelville and the Waynesboro-Cumberland-Hamblen soil associations. The original vegetation was mixed hardwoods forest consisting mainly of water-tolerant species. Practically all areas have been cleared and are now used mainly for pasture, hay, and corn.

Dunning soils are associated mostly with the Lobelville and Lee soils, which were derived from materials originating chiefly from low-grade limestone, and with Hamblen and Prader soils, which were derived from materials originating chiefly from sandstone. They differ from the Lobelville and Hamblen soils in having darker color, finer texture, less acid reaction, somewhat slower internal drainage, and a firmer or more plastic consistence. The Dunning soils are better drained, darker colored, finer textured, firmer, and less acid throughout than the Lee and Prader soils.

Dunning silty clay loam, drained phase (Do) (Capability unit IIw-1).—This dark colored, almost black, somewhat poorly drained soil occupies stream bottoms. The principal areas are on the flood plains of Bean and Betsy Willis Creeks in the Waynesboro-Cumberland-Hamblen soil association.

The following is a description of this soil:

0 to 15 inches, very dark gray (10YR 3/1) friable to firm silty clay loam; plastic when wet and hard when dry; moderate fine granular structure; neutral in reaction; range in thickness, 10 to 18 inches.

15 to 30 inches, very dark gray (10YR 3/1) to dark gray (10YR 4/1) firm to very firm silty clay or clay; a few, fine, faint, yellowish-brown (10YR 5/4) or brown (10YR 4/3) and olive-brown (2.5Y 4/4) to light olive-brown (2.5Y 5/4) mottles; plastic or very plastic when wet and very hard when dry; moderate medium granular or weak fine subangular blocky structure; contains a few to a moderate number of small, round, black concretions; neutral in reaction; 10 to 20 inches thick.

30 inches +, mottled gray (10YR 6/1 to 5/1), brown (10YR 4/3), or dark grayish-brown (10YR 4/2) and yellowish-brown (10YR 5/6) to light olive-brown (2.5Y 5/4) or olive-brown (2.5Y 4/4) firm clay, silty clay, or sandy clay; plastic when

wet and hard or very hard when dry; many, fine to medium, distinct mottles; no well-defined structure; a few to a moderate number of small, round, black concretions and a few small light-colored quartzite pebbles; slightly acid; horizon underlain by stratified layers of sandy and clayey materials.

This soil includes a few small areas of Dunning silt loam, drained overwash phase. It also includes about 60 acres of soil that has developed from local alluvial-colluvial accumulations. The areas of this included soil have slopes ranging mostly from 2 to 3 percent, and they occur at or near the base of the lower slopes of the Cumberland escarpment. This included soil has more distinct and more strongly developed horizons, is more erosive, and is less productive than the soil with which it has been mapped.

Dunning silty clay loam, drained phase, has slow to very slow surface runoff and internal drainage. The soil is neutral to slightly acid and high in organic matter and plant nutrients. Permeability is slow in the surface soil and very slow in the subsoil. The soil has a high water-supplying capacity. Poor aeration and a fluctuating water table make the soil unsuitable for most deep-rooted legumes. Workability is fair, but because it is firm or plastic, the soil can be worked only within a narrow range of moisture content. If it is worked when wet, the large clods that form are very hard and interfere with further tillage and seeding. When dry, the soil is hard and large cracks form. Drainage by means of open ditches and bedding would not greatly broaden the suitability of this soil. Poor tilth, risk of floods, and the fluctuating water table would still be serious handicaps.

Dunning silt loam, drained overwash phase (Dm) (Capability unit IIw–1).—This soil differs from Dunning silty clay loam, drained phase, in having a more friable, coarser textured, and better drained surface soil. On most of the soil there are deposits of silty to loamy sediments ranging mostly from 5 to 12 inches in thickness.

Following is a description of this soil:

0 to 8 inches, very dark grayish-brown (10YR 3/2) or dark grayish-brown (10YR 4/2) friable, heavy silt loam to loam; weak fine granular structure; slightly acid or neutral.

8 to 16 inches, very dark grayish-brown (10YR 3/2), very dark gray (10YR 3/1), or dark-gray (10YR 4/1) friable to firm heavy silt loam or silty clay loam; moderate fine or medium granular structure; neutral in reaction.

16 to 36 inches, very dark gray (10YR 3/1) or dark-gray (10YR 4/1) firm to very firm silty clay or clay; a few, fine, faint, yellowish-brown or brown and olive-brown to light olive-brown mottles; neutral in reaction.

36 inches +, mottled gray, brown or dark grayish-brown, and yellowish-brown to light olive-brown or olive-brown firm clay, silty clay, or sandy clay; many, fine or medium, distinct mottles; slightly acid.

This soil is more productive, is easier to work and to maintain in good tilth, and can be worked over a wider range of moisture content than Dunning silty clay loam, drained phase.

Dunning silt loam, silty substratum phase (Dn) (Capability unit IIw–1).—This soil differs from Dunning silty clay loam, drained phase, chiefly in being more friable and silty and in having a wider range in acidity. It occurs on level flood plains along small streams, along intermittent drainageways, and in depressions. It is associated chiefly with Lobelville and Lee soils on first bottoms and with the Guthrie and Lawrence soils in depressions. The soil has formed from sediments washed chiefly from the Dickson, Mountview, and Baxter soils. It formed in swampy or submerged areas in which natural drainage subsequently improved.

This soil is described as follows:

0 to 15 inches, dark-gray (10YR 4/1) or very dark gray (10YR 3/1) friable silt loam; weak fine granular structure; slightly acid.

15 to 30 inches, dark-gray (10YR 4/1) to very dark gray (10YR 3/1) friable silty clay loam that is slightly plastic when wet; a few faint, fine, gray (10YR 6/1) and strong-brown (7.5YR 5/8) mottles; weak fine or medium granular structure; a few soft, black concretions and fine pieces of chert gravel or chert fragments; slightly acid or neutral.

30 inches+, mottled gray (10YR 6/1), dark-gray (10YR 4/1), light yellowish-brown (2.5Y 6/4), light olive-brown (2.5Y 5/4), and olive-brown (2.5Y 4/4) friable heavy silt loam or silty clay loam that is slightly plastic when wet; many, fine, distinct mottles; medium or strongly acid.

The soil varies in texture and consistence, in the thickness of the different layers, and in degree of mottling. In a few places the substratum may be a plastic silty clay. Locally, the surface soil is gray or somewhat brownish as a result of overwash or cultivation.

Where drainage has been improved by means of open ditches or bedding, crops such as corn, soybeans, sorghum, and lespedeza are well suited.

Emory series

The Emory series consists of well-drained soils of the colluvial lands. They have formed from material that washed or drifted from soils on uplands underlain mostly by high-grade limestone. They occur on level to gently sloping relief at the base of slopes, on colluvial fans, in slight depressions, and along small drainageways.

The Emory soils have a very friable or friable silt loam surface soil, a friable heavy silt loam or light silty clay loam subsoil, and a friable silty clay loam underlying layer.

The color and texture of these soils vary from place to place, depending largely on the kind of soil from which the parent material has washed and the length of time it has been in place. The surface soil varies in color from brown to dark reddish brown. In texture it varies from a silty clay loam, where the soil material washed from eroded Decatur and Cumberland soils, to a gritty silt loam or loam, where the soil material washed from Baxter and Waynesboro soils. Below a depth of about 24 inches, the soil is extremely variable in color and in degree of variegation or mottling. The color may range from dark reddish brown in one profile to mottled yellowish brown or dark yellowish brown in another nearby. The depth to the alluvial accumulation in which the soil formed ranges from about 18 inches to more than 48 inches. The relief ranges from level to gently sloping. A few areas in depressions, shallow sinks, or along intermittent drainageways are subject to flooding or ponding for brief periods.

The Emory series has only one soil mapped in Coffee County. It is not extensive but is widely distributed in small areas throughout most of the county. It occurs mostly in the Waynesboro-Cumberland-Hamblen and the Cookeville-Cumberland-Hermitage soil associations in association with the Cumberland and Waynesboro soils. The Emory soil is inherently fertile and well suited to all the common crops of the county.

Emory soils are associated with the Decatur, Cookeville, Pembroke, Cumberland, Etowah, and Waynesboro soils, which have contributed most of the parent material of the Emory soils. Emory soils are also associated with the Hermitage soils, Lindside silt loam, local alluvium phase, and the Greendale soils. The Emory soils differ from the Hermitage soils mainly in being more permeable and having less profile development. These soils are similar to Lindside silt loam, local alluvium phase, in parent material and position but differ in being better drained. The Emory soils are darker colored, less cherty, less acid, and more productive than the associated Greendale soils.

Emory silt loam (Ea) (Capability unit I–1).—A profile of this soil has the following characteristics:

A_1 0 to 15 inches, dark reddish-brown (5YR 3/3), reddish-brown (5YR 4/3), or dark-brown (7.5YR 3/2) very friable or friable silt loam; moderate fine granular structure to weak very fine subangular blocky structure; medium to slightly acid; range in thickness, 10 to 18 inches.

C_1 15 to 26 inches, reddish-brown (5YR 4/4 to 4/3) friable heavy silt loam or light silty clay loam; a few fine, faint, dark reddish-brown (5YR 3/3) variegations or splotches; moderate fine granular to weak very fine subangular blocky structure; a few black specks and pieces of finely divided chert gravel in places; medium or slightly acid.

C_2 26 to 40 inches +, dark reddish-brown (5YR 3/3) or reddish-brown (5YR 4/3) friable silty clay loam; a few fine, faint, reddish-brown (5YR 4/4) or yellowish-red (5YR 4/6) variegations; weak fine subangular blocky structure; a few black concretions 1.0 to 2.0 millimeters in diameter, and a few to a moderate number of finely divided chert fragments; medium to slightly acid.

A few small spots of Lindside silt loam, local alluvium phase, that occur in the depressions are included with this mapping unit.

Surface runoff is very slow to medium and internal drainage is medium. The soil is medium to slightly acid, high in organic matter and plant nutrients, and very high in water-supplying capacity. Permeability is moderate throughout the soil. Workability is excellent. The risk of erosion is none to slight.

Practically all areas have been cleared of the original mixed hardwoods forest and are now used chiefly for crops. Many areas are too small to map or farm separately, but even these small areas significantly affect the productivity of the fields in which they occur.

Etowah series

The Etowah series consists of moderately deep to very deep, well-drained soils on the stream terraces of medium height. They have formed under a mixed hardwoods forest from sediments washed from soils of the uplands underlain mostly by limestone, but in places by sandstone.

The Etowah soils have a dark-brown or brown friable silt loam to reddish-brown to yellowish-red friable silty clay loam surface soil. Their subsoil is reddish-brown or brown to yellowish-red or red friable to firm silty clay loam or firm silty clay. The soils range from gently sloping to sloping but are mostly gently sloping.

The surface soil varies from dark brown to brown or dark grayish brown in color and from a silt loam to loam in texture. The upper subsoil, or B_1 horizon, is extremely variable in color; it ranges from yellowish brown to reddish brown or yellowish red. In some places the subsoil becomes redder with increasing depth and continues to be of fairly uniform reddish color to depths of 48 to 50 inches or more. In other places below a depth of about 30 inches the subsoil is distinctly variegated with yellowish red, strong brown, brownish yellow, and light brownish gray. In a few areas the soil contains a mixture of sandy material. In these more sandy areas the soil has a loamy surface soil, the B horizon is either silty clay loam or clay loam, and the C horizon varies from firm silty clay to friable sandy clay loam.

Etowah silt loam, phosphatic Etowah silt loams, and Etowah silty clay loam occur in the county. The Etowah silt loam covers the largest acreage and occurs principally in the Waynesboro-Cumberland-Hamblen and the Cookeville-Cumberland-Hermitage soil associations. A few widely separated areas occur in the Dickson-Mountview-Lobelville and the Mountview-Baxter-Lobelville soil associations. The phosphatic Etowah silt loams occur in the Armour-Huntington-Lindside and the Bodine-Dellrose soil associations. These phosphatic soils are not extensive but are of local agricultural importance.

Etowah soils are associated chiefly with the Cumberland, Armour, Humphreys, Captina, and Taft soils, which were derived from similar parent material, and with Waynesboro and Sequatchie soils, which were derived mostly from sandstone materials. They differ from the Cumberland soils in being less red, somewhat coarser textured, and more friable, and from the Armour soils in being less brown throughout. The Etowah soils are less acid and more productive than the Humphreys soil. The Etowah soils do not have the compact fragipan or prominently mottled layer that occurs in the Captina soils. Etowah soils are much better drained than the associated Taft soils.

Etowah silt loam, eroded gently sloping phase (Eb) (Capability unit IIe–1).—The following describes a profile in a cultivated area:

A_p 0 to 8 inches, dark-brown (7.5YR 3/2) or brown (10YR 4/3) friable silt loam; weak to moderate fine granular structure; medium acid; range in thickness, 4 to 9 inches.

B_1 8 to 14 inches, reddish-brown (5YR 5/4), yellowish-red (5YR 5/6), or brown (7.5YR 4/4) friable silty clay loam; weak to moderate fine subangular blocky structure; an occasional fine chert or quartzite pebble and some black concretions; patchy clay skins; medium to strongly acid; range in thickness, 4 to 8 inches.

B_2 14 to 32 inches, yellowish-red (5YR 4/6) or red (2.5YR 4/6) friable to firm silty clay loam or light silty clay; moderate fine or medium subangular blocky structure; patchy to continuous clay skins; a few black concretions 1.0 to 2.0 millimeters in diameter, a few finely divided pieces of chert gravel, and an occasional small quartzite pebble; strongly acid; range in thickness, 12 to 24 inches.

B_3 32 to 40 inches, red (2.5YR 4/6) or yellowish-red (5YR 4/6) firm silty clay or light silty clay with a moderate number of fine, distinct, reddish-yellow, strong-brown (7.5YR 5/6) or yellowish-brown (10YR 5/4), and light brownish-gray (10YR 6/2) variegations; moderate medium blocky structure; patchy clay skins; a moderate number of finely divided pieces of chert gravel, a few small quartzite pebbles, and a few to a moderate number of black concretions or segregations; strongly acid; range in thickness, 4 to 10 inches.

C 40 to 60 inches +, red (2.5YR 4/6), dark-red (2.5YR 3/6), or yellowish-red (5YR 4/6 to 4/8) firm silty clay loam or silty clay; a few to a moderate number of fine, prominent, reddish-yellow (7.5YR 6/8), strong-brown (7.5YR 5/6), and brownish-yellow (10YR 6/6) variegations and a few, fine, prominent, light-gray (10YR 7/2), light brownish-gray (10YR 6/2), and pale-brown (10YR 6/3) variegations; weak to moderate medium blocky structure; many fine pieces of chert gravel, as well as a moderate number of black concretions or segregations 1.0 to 2.0 millimeters in diameter; strongly acid.

Included with this soil are areas totaling approximately 135 acres that are not eroded or only slightly eroded. The small part of this inclusion still under mixed hardwoods forest has easily recognized A_1 and A_2 horizons, and the total thickness of the A horizon ranges from 10 to 12 inches. In cultivated areas the A_1 and A_2 horizons have become mixed in the plow layer.

Etowah silt loam, eroded gently sloping phase, has slow to medium surface runoff and medium internal drainage. The soil is medium to strongly acid, medium to high in plant nutrients, moderate to high in organic matter, and high in water-supplying capacity. The soil is moderately permeable throughout. It has very good workability. The erosion hazard is slight to moderate.

Etowah silt loam, eroded gently sloping phosphatic phase (Ec) (Capability unit IIe–1).—This soil differs from Etowah silt loam, eroded gently sloping phase, chiefly in containing medium to large amounts of phosphate because its parent materials were washed from soils derived from phosphatic limestone. It further differs in having (1) more chert gravel distributed through the solum, (2) a silt loam surface soil and silty clay loam subsoil, (3) a wider range in the depth of the alluvial deposit, or from 2 to 12 feet or more, and (4) a reddish-brown or yellowish-red B_1 horizon. The soil is in all places underlain by phosphatic argillaceous limestone residuum.

The following describes a profile in a cultivated area:

A_p 0 to 5 inches, dark-brown (10YR 3/3) friable silt loam.

B_1 5 to 15 inches, reddish-brown (5YR 4/4) or yellowish-red (5YR 5/6) friable silty clay loam.

B_2 15 to 38 inches, yellowish-red (5YR 4/6) friable to firm silty clay loam; a few fine, faint, reddish-yellow (7.5YR 6/6) to yellowish-brown variegations.

B_3 38 to 60 inches, yellowish-red (5YR 4/6) or red (2.5YR 4/6) firm silty clay loam to light silty clay showing a moderate number of fine, distinct, light yellowish-brown (10YR 6/4), pale-brown (10YR 6/3), and light brownish-gray (10YR 6/2) variegations.

C 60 inches +, firm heavy silty clay loam or silty clay loam variegated with yellowish red, strong brown, yellowish brown, light gray, and very pale brown; variegations fine, prominent, and common to many; moderate to numerous pieces of fine chert gravel.

Etowah silt loam, eroded sloping phosphatic phase (Ed) (Capability unit IIIe–1).—This soil differs from Etowah silt loam, eroded gently sloping phosphatic phase, chiefly in having a thinner and more variable surface soil and in having formed on alluvial deposit that is more variable in depth, and on the average, somewhat less deep. Included are a few small areas that differ in being severely eroded, in having stronger slopes, or both.

Etowah silty clay loam, severely eroded sloping phase (Ee) (Capability unit IIIe–1).—This soil differs from Etowah silt loam, eroded gently sloping phase, chiefly in having a generally finer textured surface, stronger slopes, and less depth. The surface soil varies greatly in texture and color because erosion has not removed soil material uniformly. Most of the soil has a reddish-brown to yellowish-red surface layer or plow layer.

Included with this mapping unit are areas that differ in slope and erosion. Areas totaling about 40 acres are gently sloping, and others totaling 30 acres are moderately eroded. About 3 acres is not eroded because it remains in hardwoods forest.

Because of its fairly strong slopes, very low organic-matter content, low water-supplying capacity, poor tilth, and high hazard of further erosion, this soil is not well suited to intertilled crops.

Gravelly alluvial land

Gravelly alluvial land (Ga) (Capability unit VIIs–1).—This land consists chiefly of stony, gravelly or cobbly, or sandy alluvium, with which a slight amount of silty and clayey material has been mixed.

This miscellaneous land type occurs in small narrow areas along perennial streams, intermittent drainageways, and overflow channels. Slopes range from 1 to 5 percent. The alluvium has been deposited chiefly by fast-flowing water. Many small areas, however, have formed because floodwaters moving along overflow channels have removed the finer soil materials.

Gravelly alluvial land is inextensive and not important to the agriculture. The areas are widely distributed. Most of them are idle and sparsely vegetated with scrubby plants. Sycamore, willow, ash, and alder are the most common trees.

Greendale series

The Greendale series consists of moderately well drained to well drained brown soils on recent colluvium and alluvium. Their parent materials have washed or rolled chiefly from the associated Baxter, Bodine, Mountview, and Dickson soils. They occur on level to gently sloping foot slopes, on colluvial fans, in narrow areas along small drainageways, and in slight depressions or well-drained sinks.

The Greendale soils have a brown friable silt loam or cherty silt loam surface soil. Their subsoil is a yellowish-brown to light yellowish-brown, friable, heavy silt loam to light silty clay.

The surface soil ranges from grayish brown or dark grayish brown to yellowish brown in color and from silt loam to loam in texture. The subsoil, or the C_1 and C_2 layers, varies in texture from heavy silt loam to light silty clay loam. The depth of the colluvial and alluvial accumulation on which the soils have formed ranges from 20 to 72 inches.

The Greendale soils are widely distributed in small areas throughout the Bodine-Dellrose, the Dickson-Mountview-Lobelville, and the Mountview-Baxter-Lobelville soil associations. They occur less frequently in the Mountview-Cookeville-Pembroke and the Cookeville-Cumberland-Hermitage soil associations. The soils are important agriculturally, although their acreage is relatively small. A large part of the soils has been cleared and used for crops. The native vegetation is mixed hardwoods forest with a high proportion of oaks and hickories.

In position, the Greendale soils are similar to the associated Emory and Pace soils and the local alluvium phases of the Lobelville soils. They differ from the Emory soil in being lighter colored, more cherty, less productive, and more acid; they also have a wider range of drainage. The Greendale soils are moderately well drained to well drained, whereas the Lobelville soils are somewhat poorly drained to moderately well drained. The Greendale soils differ from the Pace soils in having weaker profile development and less contrast between profile horizons.

Greendale silt loam (Gc) (Capability unit I–1).—The following describes a profile of this soil in a cultivated area:

A_p 0 to 12 inches, brown (10YR 4/3 or 5/3) friable silt loam; weak fine granular structure; medium to strongly acid; range in thickness, 8 to 16 inches; in forested areas the upper 2 inches is dark grayish-brown (10YR 4/2).

C_1 12 to 24 inches, yellowish-brown (10YR 5/4) friable silt loam or light silty clay loam; a few, fine, faint, light yellowish-brown (10YR 6/4), light brownish-gray (10YR 6/2), or pale-brown (10YR 6/3) mottles or variegations in the lower part; weak medium granular or weak very fine subangular blocky structure; contains a few angular chert fragments ¼ to 3 inches in diameter; medium acid; range in thickness, 6 to 18 inches.

C_2 24 to 36 inches +, yellowish-brown (10YR 5/4) or light yellowish-brown (10YR 6/4) friable heavy silt loam or silty clay loam; a few to moderate number of fine, faint, pale-brown (10YR 6/3), light brownish-gray (10YR 6/2), or light-gray (10YR 6/1) mottles; weak fine subangular blocky structure; a few black concretions 1.0 to 2.0 millimeters in diameter and a few angular chert fragments ½ to 3 inches in diameter.

Included with this soil are small spots of Lobelville silt loam, local alluvium phase, and Greendale cherty silt loam.

Surface runoff is slow to medium, and internal drainage is medium. The soil is medium to strongly acid, moderate to low in organic matter, medium in plant nutrients, and high in water-supplying capacity. It is permeable to water and air and is very easily penetrated by plant roots. The soil is easily worked and kept in good tilth, but runoff from adjacent slopes is a minor problem.

Greendale cherty silt loam (Gb) (Capability unit IIs–1).—This soil differs from Greendale silt loam chiefly in amount of chert fragments. Fragments ½ to 6 inches in diameter make up 15 to 30 percent of the soil mass. It further differs in being more droughty and less productive. The soil varies chiefly in chert content. It includes a few small spots of Greendale silt loam.

Greendale cherty silt loam is easy to work and very easy to protect from erosion.

Gullied land

Gullied land (Gd) (Capability unit VIIs–1) is in areas that, before erosion, consisted of soils derived from limestone materials. Gullies occupy more than 60 percent of most areas. Slopes range from 5 to 30 percent. Practically all of the surface soil and much of the subsoil have been lost through erosion, and gullies form an intricate pattern that makes the land too rough for the operation of farm machinery.

Gullied land consists chiefly of Mimosa and Dellrose phosphatic soil materials in the Bodine-Dellrose soil association; of Mountview, Baxter, and Cookeville soil materials in the Dickson-Mountview-Lobelville, the Mountview-Cookeville-Pembroke, and the Mountview-Baxter-Lobelville soil associations; and of Cumberland and Waynesboro soil materials in the Waynesboro-Cumberland-Hamblen soil association. Consequently, the surface material is highly variable in color, texture, consistence, and chert content. Most of the intergully areas are severely eroded. Some are only moderately eroded or slightly eroded, however, and the profile in these resembles that of the original soil. Limestone outcrops occur in many places.

The exposed soil material has very poor tilth, very low water-supplying capacity, and low fertility. The areas are very conspicuous, small, and irregularly shaped. Most areas are sparsely vegetated and are slowly reverting to forest of poor quality. A few areas have been planted to pine. This land is inextensive and has very little agricultural value.

Guthrie series

The Guthrie series consists of poorly drained soils that developed under a water-tolerant hardwoods forest. They were derived from a thin mantle of loesslike silt overlying cherty limestone residuum.

Guthrie soils have a grayish very friable to friable silt loam surface soil. The subsoil is mottled friable silty clay loam in the upper part and firm, mottled silty clay loam or sandy clay in the lower part. The subsoil is underlain by a discontinuous compacted layer or fragipan.

In places the fragipan (B_{2m}) is within 12 to 15 inches of the surface, but several feet away it will be at depths of 30 to 40 inches or entirely absent. This layer is not uniform in thickness and degree of development. From place to place, or within short distances in the same area, the fragipan may range from 6 to 30 inches in thickness and from weakly to strongly developed. It ranges from friable heavy silt loam to silty clay, but silty clay loam predominates. In cultivated areas the plow layer varies from dark gray to light brownish gray.

Guthrie soils are moderately extensive and occur in the Dickson-Mountview-Lobelville soil association. Approximately 75 percent of their acreage remains in water-tolerant hardwoods forest, chiefly willow and white oaks, sweetgum, blackgum, and maple, with a scattering of ash and alder. All areas of the soils are either uneroded or have a thin overwash layer. These soils have little agricultural importance.

The Guthrie soils occupy level areas along incipient drainageways, slight depressions, and upland flats. They are associated mostly with Mountview, Dickson, Sango, and Lawrence soils. They differ from the Lawrence soil in being grayer and more poorly drained. The Guthrie soils are similar to the Purdy and Robertsville soils but differ in kind of parent material.

Guthrie silt loam (Ge) (Capability unit IVw–1).—The following describes a profile in a forested area:

A_{00} and A_0 1 to 0 inch, forest litter and leaf mold; range in thickness, 0 to 1 inch.

A_1 0 to 2 inches, dark-gray (10YR 4/1) very friable silt loam; weak fine granular structure.

A_2 2 to 8 inches, gray (10YR 5/1), light-gray (10YR 6/1), or light brownish-gray (2.5Y 6/2) friable silt loam with a few, fine, faint yellowish-brown (10YR 5/6) or light olive-brown (2.5Y 5/4) mottles or stains; weak fine granular structure; range in thickness, 4 to 15 inches.

B_{2g} 8 to 32 inches, mottled light brownish-gray (2.5Y 6/2) or gray (10YR 6/1) and light olive-brown (2.5Y 5/4 to 5/6) friable silty clay loam; many, fine to medium, distinct mottles; weak fine or very fine blocky or subangular blocky structure; irregular lower boundary with a few tongues extending down to the cherty limestone residuum; range in thickness, 8 to 30 inches.

B_{2m} 32 to 52 inches, mottled gray (10YR 6/1 or 2.5Y 6/0), light olive-brown (2.5Y 5/6), or yellowish-brown (10YR 5/6), and strong-brown (7.5YR 5/8) firm silty clay loam or silty clay; many, medium, prominent mottles; a few, fine, prominent, red (2.5YR 4/6) mottles in lower part; weak fine blocky and subangular blocky to structureless (massive) in place; a few brownish and black concretions, finely divided light-colored chert fragments, and patchy clay skins, and a few to a moderate number of gray silty clay seams or pockets.

B_b 52 to 64 inches +, mottled gray (10YR 6/1), yellowish-brown (10YR 5/6), strong-brown (7.5YR 5/6), and red (2.5YR 4/6) firm silty clay loam or silty clay; mottles prominent, many, and medium to coarse; a few to many angular chert fragments; patchy to continuous clay skins.

Inclusions are principally small areas of Lawrence and Lee soils and Guthrie silt loam, overwash phase.

Guthrie silt loam has very slow surface runoff and internal drainage. When rainfall is abundant, many areas of the soil may be completely inundated for long periods. During extended dry periods, the subsoil becomes hard or compacted, and there is little or no plant-root development. The soil is strongly or very strongly acid and, where cultivated, very low in organic matter and plant nutrients. It has fair workability when moisture conditions are favorable, which is generally not before midsummer. The very low natural fertility and poor drainage restrict the use of this soil. In favorable seasons, areas that have been properly drained, limed, and fertilized produce fair yields of soybeans, sorghums, corn, lespedeza, and pasture. Artificial drainage is not economically feasible in many areas, because suitable outlets are not available.

Guthrie silt loam, overwash phase (Gf) (Capability unit IIIw-1).—This soil differs from Guthrie silt loam chiefly in having a thicker and somewhat better drained surface soil. A recent deposit of soil material 5 to 12 inches in thickness has washed from adjacent slopes. The soil varies from brown to gray, depending mainly on the soils from which its parent material has washed and the length of time it has been in place. The Mountview and Dickson soils have contributed most of its parent material.

Guthrie silt loam, overwash phase, characteristically occupies small areas on the outer rim of larger areas of Guthrie silt loam, where the higher lying soils have eroded or where the materials have been deposited by drainageways emptying onto level or depressional areas. Inclusions occur along some of the drainageways. They consist principally of areas of Lee and Lobelville soils.

Hamblen series

The Hamblen series consists of somewhat poorly drained to moderately well drained, moderately coarse-textured soils of the bottom lands. They are recent alluvium washed from soils derived from sandstone material that has a slight mixture of limestone material. They occur on level flood plains, and nearly all areas are periodically flooded.

Hamblen soils have a very friable fine sandy loam surface soil; a friable or very friable fine sandy loam, sandy clay loam, or loam subsoil; and a friable fine sandy loam, sandy clay loam, or loam underlying layer.

The surface soil, or A_1 horizon, ranges from 8 to 18 inches in thickness. The C_{g2} horizon ranges mostly from 12 to 20 inches. In a few places, however, the soil may be faintly mottled at depths of less than 12 inches and distinctly mottled below depths of 20 inches. The C_{g2} horizon ranges from predominantly gray to mottled brown, yellow, and gray in color, and in consistence and texture, from firm clay loam or silty clay to almost loose, stratified layers of sand.

Hamblen soils are of moderate extent and agriculturally important. They occur most frequently along Bradley, Bean, and Betsy Willis Creeks in the Waynesboro-Cumberland-Hamblen soil association. They occupy small acreages in the Bodine-Dellrose and the Holston-Monongahela-Tyler soil associations.

The Hamblen soils are associated with Staser, Prader, and Dunning soils of the bottom lands and the Sequatchie and Whitwell soils of the terrace lands. They differ from the Dunning soils in being better drained in all areas, lighter colored, coarser textured, and less firm. The Hamblen soils occupy lower positions and have a less well-developed profile than the Sequatchie and Whitwell soils.

Hamblen fine sandy loam (Ha) (Capability unit IIw-1).—A profile description of this soil follows:

A_1 0 to 12 inches, dark grayish-brown (10YR 4/2), dark-brown (10YR 3/3), or brown (10YR 4/3), very friable fine sandy loam; weak fine granular structure; medium acid to neutral.

C_{g1} 12 to 24 inches, brown (10YR 4/3) or yellowish-brown (10YR 5/4) friable or very friable fine sandy loam, sandy clay loam, or loam; a few fine, faint, light brownish-gray (10YR 6/2), dark-gray (10YR 4/1), dark brown (10YR 4/3), and light yellowish-brown (10YR 6/4), or brownish-yellow (10YR 6/6) mottles in the upper part and many in the lower part; weak to moderate fine and medium granular structure; a few black and reddish-brown concretions or stains; medium acid to neutral.

C_{g2} 24 to 36 inches +, mottled gray (10YR 6/1), yellowish-brown (10YR 5/4), and brownish-yellow (10YR 6/6) friable fine sandy loam, sandy clay loam, or loam; many, fine, distinct mottles; no well-defined structure; a few black and reddish-brown stains and concretions; medium acid to neutral; underlain at variable depths by stratified layers of sand, fine sandy loam, and clay loam; layers contain some clayey material and gravel.

Some areas of Hamblen loam are included with this soil as mapped. Also included are a few areas consisting of an overwash layer of sandy material 12 to 20 inches in thickness that overlies a buried profile of Dunning soil. The overwash layer is mostly dark grayish-brown to very dark grayish-brown fine sandy loam in the upper part, and in the lower part, a dark-gray sandy clay loam or light clay loam faintly mottled with yellowish brown, brownish yellow, or light olive brown.

Hamblen fine sandy loam has very slow to slow surface runoff and slow internal drainage. The upper part of the soil is moderately permeable to water. The lower part is saturated with water much of the time because the water table is alternately high and low and development of plant roots is therefore restricted. The soil is medium acid to neutral, high in organic matter and water-supplying capacity, and medium in plant nutrients. It has good workability. There is some scouring by floodwaters, but the soil is otherwise easy to conserve.

Hamblen fine sandy loam, local alluvium phase (Hb) (Capability unit IIw-1).—This soil differs from Hamblen fine sandy loam chiefly in position. It further differs in being somewhat finer textured throughout, especially in the deeper part of the profile, where it ranges mostly from a loam to fine sandy clay loam or light clay loam.

The soil occupies nearly level areas along small drainageways, at the base of slopes, and in small depressions. The areas are small and usually long and narrow. The local alluvium has washed chiefly from the Holston, Monongahela, Waynesboro, and Nolichucky soils, with which this soil is associated. This soil is also assocaited with Tyler, Purdy, Prader, Sequatchie, Whitwell, and Staser soils. The soil varies in color, texture, and thickness of its various layers.

Hartsells series

The Hartsells series consists of moderately coarse-textured shallow to very deep, well-drained soils of the uplands. They have formed under a predominantly deciduous forest from material weathered from nearly level bedded acid sandstone.

Hartsells soils have a loose fine sandy loam surface soil stained with dark-gray organic matter, a friable sandy clay loam or clay loam subsoil, and a friable to firm sandy clay loam or clay loam underlying layer, and sandstone bedrock usually at depths of 3 to 4 feet.

The depth to bedrock ranges from 2 to 6 feet. Locally, there are a few outcrops of the level-bedded sandstone. The B_2 horizon varies locally from a friable fine sandy loam to a firm sandy clay loam or clay loam. The underlying material is generally hard sandstone, but in a few places it consists of almost loose sand containing many small, rounded quartzite pebbles.

Hartsells soils occur only in the Hartsells-Muskingum soil association in the extreme eastern part of the county. They make up approximately 75 percent of this small soil association and contribute very little, if any, to the agriculture of the county. An estimated 95 percent of the series is in forest consisting chiefly of white and red oaks and hickories.

Hartsells soils are associated almost exclusively with the Muskingum soil in this county. The Hartsells and Muskingum soils were derived from similar parent materials. The Hartsells soils have an ABC profile nearly free of stone and occupy gently sloping to sloping relief. The Muskingum soil has a shallow to deep weakly developed stony AC profile and sloping to strongly sloping relief.

Hartsells fine sandy loam, gently sloping phase (Hc) (Capability unit IIe–3).—The following describes a profile of this soil in a forested area:

A_{00} and A_0 1 to 0 inch, forest litter and leaf mold; range in thickness, ½ to 1 inch.

A_1 0 to 1 inch, grayish-brown (10YR 5/2) loose fine sandy loam stained with dark-gray (10YR 4/1) organic matter; weak fine granular to structureless (single grain); strongly or very strongly acid.

A_2 1 to 10 inches, yellowish-brown (10YR 5/4) very friable fine sandy loam; weak fine to medium granular structure; strongly or very strongly acid; range in thickness, 6 to 10 inches.

B_2 10 to 30 inches, yellowish-brown (10YR 5/4 to 5/6) or brownish-yellow (10YR 6/6) friable sandy clay loam or clay loam; weak medium subangular blocky structure; strongly or very strongly acid; range in thickness, 12 to 30 inches.

C 30 to 48 inches, yellowish-brown (10YR 5/6) or strong-brown (7.5YR 5/6) friable to firm sandy clay loam or clay loam; a few gray (10YR 6/1) and red (2.5YR 4/6) splotches; weak medium subangular blocky structure; a few to many white quartzite pebbles 5.0 to 10.0 millimeters in diameter; sandstone bedrock generally occurs at depths of 3 to 4 feet.

A small acreage has been cleared and cultivated and is now slightly eroded or eroded. These areas differ in having a grayish-brown or yellowish-brown surface soil 6 to 8 inches in thickness. These included areas are lying idle and reverting to forest. Also included are a few small areas that differ in having a yellowish-red or red subsoil.

Hartsells fine sandy loam, gently sloping phase, has slow to medium surface runoff and medium to rapid internal drainage. The soil is strongly to very strongly acid and low in plant nutrients and organic matter. Permeability is moderately rapid throughout. The water-supplying capacity is moderate to moderately low. The feeding zone for deep-rooted legumes is somewhat limited in some areas by the shallowness of the soil to bedrock. The soil has very good to excellent workability and has excellent physical properties for the maintenance of good tilth. The soil can be worked throughout a wide range in moisture content. The erosion hazard is slight to moderate.

Hartsells fine sandy loam, sloping phase (Hd) (Capability unit IIIe–3).—This soil differs from Hartsells fine sandy loam, gently sloping phase, chiefly in having a wider range in depth and a lower average depth to bedrock. The soil has good workability and good tilth and is easily maintained. The hazard of erosion is moderate.

Hermitage series

The Hermitage series consists of deep to very deep well-drained soils that developed from old colluvial accumulations that rolled or washed chiefly from uplands underlain by high-grade limestone. They occur on gently sloping to sloping relief at the base of slopes occupied by the Decatur, Cookeville, Baxter, Talbott, and Cumberland soils.

Hermitage soils have a dark-brown, dark reddish-brown, or reddish-brown friable silt loam or cherty silt loam surface soil. Their subsoil is a red yellowish-red, or brown friable silty clay loam to a dark-red or red friable to firm silty clay loam.

The depth of the colluvial deposit in which the soils formed ranges from 2 to 10 feet. The surface soil varies from brown to dark reddish brown in color and from 6 to 10 inches in thickness. The subsoil ranges from yellowish red or strong brown to dark red within a short distance. The texture of the subsoil ranges from heavy silt loam to light silty clay. Locally, chert fragments occur on the surface and through the profile, but not in quantities that interfere with tillage.

Hermitage soils are mostly in the Waynesboro-Cumberland-Hamblen and the Cookeville-Cumberland-Hermitage soil associations. Small acreages occur elsewhere. These soils are not extensive but are, nevertheless, important to agriculture.

The Hermitage soils are associated mostly with the Emory, Swaim, and Pace soils. Hermitage soils have well-defined ABC horizons, whereas the Emory soil has a weakly developed AC profile and is younger. They differ from the Swaim soils principally in having less firm consistence, coarser texture, and a less firm subsoil. The Hermitage soils have a browner surface soil than the Pace soils.

Hermitage silt loam, eroded gently sloping phase (Hg) (Capability unit IIe–1).—In a cultivated area this soil has a profile like the following:

A_p 0 to 9 inches, dark-brown (10YR 3/3 or 7.5YR 3/2) or dark reddish-brown (5YR 3/4) very friable silt loam; moderate fine granular structure; medium acid; range in thickness, 6 to 10 inches.

B_1 9 to 15 inches, reddish-brown (5YR 4/4), yellowish-red (5YR 5/6), or brown (7.5YR 4/4) friable light silty clay loam; weak to moderate very fine subangular blocky structure; medium or strongly acid; range in thickness, 4 to 10 inches.

B_2 15 to 32 inches, yellowish-red (5YR 4/6), red (2.5YR 4/6) or dark red (2.5YR 3/6) friable silty clay loam; moderate fine subangular blocky structure; patchy clay skins; a moderate number of black ferromanganese concretions or segregations 0.5 to 2.0 millimeters in diameter and a few finely divided chert fragments; medium or strongly acid; range in thickness, 14 to 24 inches.

B_3 32 to 45 inches, yellowish-red (5YR 4/6) or red (2.5YR 4/6) friable to firm silty clay loam; many, fine, distinct, light yellowish-brown (10YR 6/4), pale-brown (10YR6/3), and light brownish-gray (10YR 6/2) variegations; moderate fine to medium subangular blocky structure; a moderate number of black concretions and segregations 0.5 to 2.0 millimeters in diameter and a few to a moderate number of fine chert fragments; patchy clay skins; medium or strongly acid; range in thickness, 6 to 20 inches.

C 45 to 60 inches +, red (2.5YR 4/6) or yellowish-red (5YR 4/6) firm silty clay loam or light silty clay loam; many fine or medium, prominent, light yellowish-brown (10YR 6/4) and brownish-yellow (10YR 6/6) variegations and a few fine, prominent, light brownish-gray (10YR 6/2), light-gray (10YR 7/2), and dark-red (2.5YR 3/6) variegations; weak to moderate medium blocky structure; a moderate number of black concretions and segregations, and a moderate number of angular chert fragments ½ to 3 inches in diameter.

Included with this soil are a few small widely distributed areas that differ in being severely eroded and that have a reddish-brown or yellowish-red silty clay loam surface soil.

Surface runoff is slow to medium, and internal drainage is medium. Rainfall is readily absorbed and well retained. The soil is moderate to high in organic matter, medium to high in plant nutrients, medium to strongly acid, and high in water-holding capacity. Permeability is moderate in the surface soil and moderate to slow in the subsoil. The soil has very good workability and can be tilled over a fairly wide range in moisture conditions (fig. 8).

Hermitage silt loam, gently sloping phase (Hf) (Capability unit IIe–1).—This soil differs from Hermitage silt loam, eroded gently sloping phase, principally in depth of the surface soil. It has the same slope range (2 to 5 percent) as Hermitage silt loam, eroded gently sloping phase, but the average slope is slightly less. The surface soil ranges from 10 to 14 inches in thickness. Most of this soil has been cleared and is used for crops.

Hermitage silt loam, eroded sloping phase (Hh) (Capability unit IIIe–1).—This soil differs from Hermitage silt loam, eroded gently sloping phase, in having a wider range in depth and, on the average, slightly less depth. The surface soil or plow layer is about 6 inches deep. In most places there has been some mixing of surface soil and upper subsoil material, and the plow layer therefore has a reddish-brown color. Included is a small acreage of severely eroded soil that has a yellowish-red friable to firm silty clay loam surface layer.

Figure 8.—**On left, oats on Hermitage silt loam, eroded gently sloping phases, on right, Greendale silt loam. In background, unimproved pasture on Baxter cherty silt loam, eroded strongly sloping phase.**

Hermitage cherty silt loam, eroded sloping phase (He) (Capability unit IIIe–2).—This soil differs from Hermitage silt loam, eroded gently sloping phase, chiefly in chert content. Chert fragments ½ to 3 or 4 inches in diameter are on the surface and distributed through the profile in quantities that somewhat interfere with tillage.

Included are areas having different slope and degree of erosion. A few small sloping and gently sloping areas in mixed hardwoods forest are uneroded or only slightly eroded. The largest inclusion, approximately 60 acres, differs only in being gently sloping. One small eroded area is strongly sloping. Approximately 20 acres is sloping, is severely eroded, or has a moderate number of shallow gullies. In the severely eroded areas the surface layer is a silty clay loam.

Holston series

In the Holston series are gently sloping to sloping well-drained soils on medium-high and high stream terraces. These soils have formed in old alluvium washed mainly from soils that developed from products weathered from sandstone and some limestone.

Holston soils have a surface soil that is dark grayish-brown or grayish-brown to yellowish-brown very friable loam to yellowish-brown friable to firm clay loam. Their subsoil is a yellowish-brown or light yellowish-brown friable to firm clay or sandy clay loam.

The alluvial deposit in which the soils have formed ranges from 3 to 15 feet in depth, and it averages about 4 feet. Where the alluvium is thin over limestone residuum, the soils are notably more firm and finer textured than where the alluvium is 4 feet or more deep. The soils vary chiefly in texture throughout and in degree of mottling in the B_3 and C horizons. In many places, especially on the smoother gentle slopes, a weak incipient fragipan replaces the B_3 horizon. In these places the soils are gradational between the Holston and the Monongahela soils. In disturbed areas the soils have a grayish-brown to yellowish-brown surface soil.

Large areas of Holston soils are in the Holston-Monongahela-Tyler soil association, and small areas are in the Dickson-Mountview-Lobelville and the Waynesboro-Cumberland-Hamblen associations. Although not extensive, these soils are of moderate agricultural importance.

Holston soils are associated chiefly with the Monongahela, Tyler, Purdy, Waynesboro, and Nolichucky soils. They do not have a fragipan, but the Monongahela soils do. Holston soils differ from the Waynesboro and Nolichucky soils mostly in color of the B horizon. Holston soils are also associated with the Sequatchie and Whitwell soils on lower stream terraces. They have stronger differences in layers and a lighter colored A horizon than the Sequatchie and Whitwell soils.

Holston loam, gently sloping phase (Hm) (Capability unit IIe–3).—The following describes a profile of this soil in a forested area:

A_{00} and A_0 1 to 0 inch, forest litter and leaf mold; range in thickness, 0 to 1 inch.

A_1 0 to 1 inch, dark grayish-brown (10YR 4/2) or grayish-brown (10YR 5/2) very friable loam; weak fine crumb or granular structure; strongly acid.

A_2 1 to 8 inches, light yellowish-brown (10YR 6/4) very friable loam; weak to moderate fine granular or weak very fine subangular blocky structure; strongly or very strongly acid; range in thickness, 4 to 10 inches.

B_1 8 to 11 inches, yellowish-brown (10YR 5/4) or light yellowish-brown (10YR 6/4) friable loam; weak very fine subangular blocky structure; strongly or very strongly acid; range in thickness, 2 to 6 inches.

B_2 11 to 28 inches, yellowish-brown (10YR 5/4 to 5/6) friable light clay loam, heavy loam, or sandy clay loam; weak or moderate fine to medium blocky structure; some patchy clay skins; a few small quartzite pebbles and fine pieces of chert gravel; strongly to very strongly acid; range in thickness, 16 to 25 inches.

B_3 28 to 36 inches, yellowish-brown (10YR 5/4) friable to firm light clay loam or sandy clay loam; many, fine, prominent, light-gray (10YR 7/2), brownish-yellow (10YR 6/6) to yellowish-brown (10YR 5/6), yellowish-red (5YR 4/6), and brown (7.5YR 4/4) mottles; moderate fine to medium blocky structure; patchy clay skins; a few small quartzite pebbles and fine pieces of chert gravel; strongly or very strongly acid; range in thickness, 4 to 12 inches.

C 36 to 54 inches, mottled yellowish-brown (10YR 5/6) or brownish-yellow (10YR 6/6), yellowish-red (5Y 4/6) or red (2.5YR 4/6), and gray (10YR 6/1) firm clay loam or sandy clay loam; mottles prominent, many, and medium; a few patchy clay skins on vertical faces of the structure peds; a few to a moderate number of fine pieces of gravel and small quartzite pebbles; strongly or very strongly acid; underlain by cherty or moderately cherty limestone residuum.

Surface runoff is slow to medium, and internal drainage is medium. The soil is strongly to very strongly acid, low in organic matter and plant nutrients, and moderate in water-supplying capacity. Permeability is moderate throughout. The soil has excellent workability, can be kept in good tilth, and can be tilled throughout a fairly wide range in moisture content. The erosion hazard is slight to moderate.

Holston loam, eroded gently sloping phase (Hn) (Capability unit IIe–3).—This soil differs from Holston loam, gently sloping phase, in having a slightly shallower grayish-brown to yellowish-brown surface soil. Included are areas totaling approximately 60 acres in which the soil is severely eroded and has a yellowish-brown friable light clay loam or heavy loam surface soil.

Holston loam, sloping phase (Ho) (Capability unit IIIe–3).—This soil is similar to Holston loam, gently sloping phase, in the texture, color, consistence, and structure of the profile layers. It differs principally in occupying stronger slopes. This soil has medium surface runoff and medium internal drainage. It has good workability. The hazard of erosion is moderate.

Holston loam, eroded sloping phase (Hp) (Capability unit IIIe–3).—This soil differs from Holston loam, gently sloping phase, in having a grayish-brown to yellowish-brown surface soil about 6 inches in thickness. The depth of the alluvial deposit in which the soil formed has a wider range and averages slightly less than for the gently sloping phase. A few severely eroded spots that have a friable clay loam surface soil are included.

Holston clay loam, severely eroded sloping phase (Hk) (Capability unit IIIe–3).—This soil differs from Holston loam, gently sloping phase, chiefly in having a friable to firm yellowish-brown surface soil. It further differs in having a few gullies and shallower depth to the underlying limestone residuum. This soil is poor for row crops, largely because of its rapid surface runoff, sloping relief, low supply of plant nutrients, and very low supply of organic matter, and high erosion hazard.

A few small included areas have a moderate number of gullies. These gullies are numerous enough and deep enough to hamper normal tillage greatly or to make it impractical.

Humphreys series

The soils of the Humphreys series are well drained and occur on low stream terraces. The alluvium from which they were formed was washed from uplands underlain chiefly by limestone. Most of the alluvial material was washed from Baxter, Mountview, and Dickson soils. This series is represented by only one soil in Coffee County.

Humphreys soils have a brown friable silt loam surface soil and a yellowish-brown friable silt loam to silty clay loam subsoil.

The surface soil varies mostly from 6 to 12 inches in thickness. In a few small areas remaining in forest, the A_1 horizon is grayish brown or dark grayish brown and the A_2 horizon is yellowish brown to brown. Areas of the soil along the Duck River and in places along some of the larger creeks contain noticeable amounts of sand and chert gravel in all parts of the profile, but most of these materials are in the C horizon. Along smaller streams the soils generally contain less sand and are more mottled in the C horizon. Locally, the surface soil is a loam or cherty silt loam. The B_2 horizon may range from light yellowish brown to strong brown or brown.

Typically, the Humphreys soils occur on gently sloping low stream terraces that are 2 to 6 feet above the associated bottom lands. A small part, however, occupies short slopes or escarpmentlike positions. The soils are widely distributed in the Dickson-Mountview-Lobelville, the Mountview-Cookeville-Pembroke, and the Mountview-Baxter-Lobelville soil associations. Although relatively small in extent, they have moderate agricultural importance.

Humphreys soils are associated mostly with the Captina and Etowah soils of the terrace lands, Lobelville soils of the bottom lands, and Greendale soils of the colluvial lands. They are better drained and lack the fragipan in the deeper parts of the profile that is characteristic of the Captina soils. Humphreys soils are younger than the Captina soils because their profile is not well developed and the horizons are not easily distinguishable. The surface soil of the Humphreys soils is not so brown and the subsoil is not so well developed as that of the Etowah soils.

Humphreys silt loam, gently sloping phase (Hr) (Capability unit IIe–3).—The following describes a profile of this soil in a cultivated area:

A_p 0 to 8 inches, brown (10YR 5/3) or (10YR 4/3) friable silt loam; weak fine granular structure or very fine subangular blocky structure; medium or strongly acid; range in thickness, 6 to 10 inches.

B_1 8 to 11 inches, yellowish-brown (10YR 5/4) friable heavy silt loam or light silty clay loam; weak very fine or fine subangular blocky structure; strongly acid; range in thickness, 2 to 6 inches.

B_2 11 to 34 inches, yellowish-brown (10YR 5/4 to 5/6) friable silty clay loam; weak to moderate fine and medium subangular blocky structure; a few fine pieces of chert gravel; strongly acid; range in thickness, 15 to 30 inches.

C 34 to 60 inches +, yellowish-brown (10YR 5/4) or light yellowish-brown (10YR 6/4) friable to firm cherty silty clay loam; many, fine, distinct, gray (10YR 6/1), light-gray (10YR 7/1), brownish-yellow (10YR 6/6), and strong-brown (7.5YR 5/8) mottles; a few black and reddish-brown concretions or stains; strongly acid.

Included with this soil are areas that differ mainly in slope and erosion. The largest inclusion, about 150 acres, practically all in cultivation, is uneroded chiefly because it is more nearly level. Approximately 20 acres differs only in being severely eroded, and 6 acres in hardwoods forest differs in having sloping relief and in not being eroded. About 20 acres is eroded and sloping, and about 35 acres is severely eroded and sloping.

Humphreys silt loam, gently sloping phase, has slow to medium surface runoff and medium internal drainage. The soil is medium to strongly acid, moderate in organic matter, medium to high in plant nutrients, and high in water-supplying capacity. Permeability is moderate throughout the soil. Some areas are flooded briefly in winter. The soil has excellent workability and can be kept in good tilth. The hazard of erosion is slight to moderate.

Huntington series

The Huntington series consists of brownish, friable, well-drained soils of the bottom lands. These soils have formed from sediments originating chiefly in phosphatic limestone. They occupy level to gently sloping flood plains and narrow bodies of local alluvium along small drainageways and at the base of slopes.

Huntington soils have a friable silt loam surface soil; then, a friable silt loam or silty clay loam subsoil containing a few fine pieces of rounded chert; and next, stratified layers of friable silt loam, silty clay loam, and fine sandy loam that contain some fine chert gravel and sand.

In places, especially adjacent to streambanks and along overflow channels, the texture is notably coarser throughout the profile. The surface soil varies from silt loam to loam or fine sandy loam from area to area and within short distances. The C_2 horizon ranges from a firm silty clay loam to an almost loose cherty fine sandy loam.

All Huntington soils in this county are phosphatic. They occur in the Armour-Huntington-Lindside and the Bodine-Dellrose soil associations. Although of limited extent, they are important agricultural soils.

Huntington soils are associated chiefly with the somewhat poorly drained to moderately well drained Lindside and poorly drained Lee soils. They are also associated with the Armour, Dellrose, Mimosa, and Etowah soils.

Huntington silt loam, phosphatic phase (Hv) (Capability unit I–1).—Following is a description of a profile of this soil:

A_1 0 to 12 inches, dark-brown (10YR 3/3), brown (10YR 4/3), or very dark grayish-brown (10YR 3/2) friable silt loam; weak fine granular structure; slightly acid or neutral; range in thickness, 8 to 16 inches.

C_1 12 to 30 inches, dark-brown (10YR 3/3) or brown (10YR 4/3) friable silt loam or silty clay loam; weak fine granular structure to weak very fine subangular blocky structure; a few pieces of fine chert gravel; slightly acid to neutral; range in thickness, 12 to 20 inches.

C_2 30 to 36 inches +, brown (10YR 4/3), dark-brown (10YR 3/3), or grayish-brown (10YR 5/2) friable silt loam, silty clay loam, and fine sandy loam, in stratified layers; a few to a moderate number of distinct, fine, gray (10YR 6/1) or light brownish-gray (10YR 6/2) mottles; some fine chert gravel and sand; slightly acid.

Included with this soil are a few small areas of Lindside silt loam, phosphatic phase, and Huntington cherty silt loam, phosphatic phase.

Huntington silt loam, phosphatic phase, has very slow to slow surface runoff and medium internal drainage. The soil is slightly acid to neutral, very high in water-supplying capacity, and high in plant nutrients and organic matter. The phosphorus content is high because most of the parent alluvium has washed from upland soils derived from phosphatic limestone. The soil is moderately permeable throughout the profile. It has very good workability and is easy to keep in good tilth. Control of scouring by floodwaters and runoff from higher lying slopes are the major problems in conserving the soil.

Huntington silt loam, local alluvium phosphatic phase (Hu) (Capability unit I–1).—This soil differs from Huntington silt loam, phosphatic phase, chiefly in position and in being more variable in the color of the deeper part of the profile. It occupies positions along small drainageways, narrow strips at the base of steeper slopes, and alluvial-colluvial fans.

The soil below a depth of 24 inches ranges from a dark brown to yellowish brown. Where much of the alluvial soil material has washed from soils derived from argillaceous limestone, or where the alluvial deposit is underlain at depths of about 3 feet by phosphatic limestone residuum, the surface soil may be a friable light silty clay loam and the subsurface layers may be friable to firm or slightly plastic silty clay loam or light silty clay. Finely divided chert fragments are common in some areas. In other areas the soil is practically free of chert. This local alluvium phosphatic phase is less subject to overflow than Huntington silt loam, phosphatic phase.

Huntington cherty silt loam, phosphatic phase (Ht) (Capability unit I–1).—This soil differs from Huntington silt loam, phosphatic phase, chiefly in containing, throughout the profile, angular chert fragments and waterworn chert gravel ¼ to 3 inches in diameter. The chert content is highly variable both on the surface and through the profile, and in a few places about half of the soil mass consists of chert. The soil is underlain in many places by gravel beds at depths of 24 to 36 inches. In a few areas, small, very cherty spots are common as a result of local alluvial accumulations or the removal of finer soil material by overflow waters. The soil further differs from Huntington silt loam, phosphatic phase, in having a higher infiltration rate and a lower water-supplying capacity and in being less productive and slightly more difficult to work. As mapped, the soil includes a few small areas of Huntington silt loam, phosphatic phase.

Huntington cherty silt loam, local alluvium phosphatic phase (Hs) (Capability unit IIs–1).—This soil differs from Huntington silt loam, phosphatic phase, chiefly in chert content and position. Chert fragments, mostly from ¼ to 6 inches in diameter, are scattered through the profile and have accumulated on the surface in quantities that somewhat interfere with the use of farm machinery. The soil occupies slopes ranging from 1 to 5 percent. It occurs in narrow V-shaped valleys along intermittent drainageways, on narrow strips at the base of slopes, and on fan-shaped, alluvial-colluvial deposits.

Profile description:

A_1 0 to 12 inches, dark-brown (10YR 3/3) or brown (10YR 4/3) friable cherty silt loam.

C_1 12 to 22 inches, brown (10YR 4/3) or yellowish-brown (10YR 5/4) friable cherty silt loam or light silty clay loam.

C_2 22 to 36 inches +, splotched or variegated brown (10YR 4/3) and yellowish-brown (10YR 5/4) friable cherty silt loam or silty clay loam.

This soil is somewhat lower in water-supplying capacity than Huntington silt loam, phosphatic phase, because it is more porous and because the cherty profile increases the infiltration of water. It is also somewhat lower in plant nutrients, especially phosphorus, the content of which varies from place to place according to the source of the parent material. The parent material originated chiefly from the Dellrose, Armour, Pace, Bodine, and Mimosa soils, Rockland, moderately steep, and Rockland, sloping.

Lawrence series

The Lawrence series consists of somewhat poorly drained soils on level upland plains and divides and along incipient drainageways in the Highland Rim. The soils have developed in a thin, relatively chert-free, loesslike silt mantle that overlies weathered products of cherty limestone. They have formed under a deciduous forest that included a high proportion of water-tolerant trees.

Lawrence soils have a very friable silt loam surface layer and a friable silt loam or light silty clay loam upper subsoil layer underlain by a fragipan. They are strongly acid throughout.

The color of the subsoil above the fragipan (B_{3m}) ranges from pale yellow to pale olive. The fragipan ranges from weakly to strongly developed and is from 8 to 28 inches thick. This layer is lacking in places. The underlying rock is cherty Warsaw limestone and the relatively chert-free St. Louis limestone. In cultivated areas the 6- to 8-inch plow layer is gray to light brownish gray. Locally, the soils have a thin overwash layer that is generally grayish brown or pale brown. The Lawrence series has only one soil in Coffee County. The Lawrence soil is moderately extensive in the Dickson-Mountview-Lobelville soil association, but it has only minor agricultural importance. It also occurs in the Mountview-Cookeville-Pembroke and the Mountview-Baxter-Lobelville soil associations, where it occupies small acreages.

The Lawrence soils are associated with the Dickson, Mountview, Sango, Guthrie, and Lobelville soils. They differ from the Dickson and Sango soils chiefly in being mottled at shallower depths, more poorly drained, and less productive. The Lawrence soils are better drained than the Guthrie soils; they are similar to the Taft and Tyler soils but differ mostly in kind of parent material.

Lawrence silt loam (La) (Capability unit IIIw-1).—The following describes a profile of this soil in a forested area:

A_{00} and A_0 1 to 0 inch, forest litter and leaf mold; range in thickness, 0 to 1 inch.

A_1 0 to 1 inch, gray (10YR 5/1), grayish-brown (2.5Y 5/2), or dark grayish-brown (2.5Y 4/2) very friable silt loam stained with organic matter; weak fine granular or crumb structure; strongly or very strongly acid; range in thickness, 1 to 2 inches.

A_2 1 to 7 inches, light yellowish-brown (2.5Y 6/4), grayish-brown (2.5Y 5/2), or pale-brown (10YR 6/3) very friable silt loam; a few, fine, faint, yellowish-brown (10YR 5/6) and light brownish-gray (2.5Y 6/2) stains or mottles; weak fine granular or very fine subangular blocky structure; strongly or very strongly acid; range in thickness, 4 to 10 inches.

B_1 7 to 15 inches, light yellowish-brown (2.5Y 6/4) or light olive-brown (2.5Y 5/4) friable silt loam or light silty clay loam; a moderate number of fine, faint, light brownish-gray (2.5Y 6/2) and yellowish-brown (10YR 5/6) mottles; weak fine blocky or subangular blocky structure; strongly or very strongly acid; range in thickness, 5 to 10 inches.

B_2 15 to 24 inches, mottled light yellowish-brown (2.5Y 6/4 or 10YR 6/4), light brownish-gray (2.5Y 6/2), and yellowish-brown (10YR 5/6) or light olive-brown (2.5Y 5/6) friable silt loam or light silty clay loam; many, fine, faint mottles; weak to moderate fine blocky or subangular blocky structure; patchy clay skins and silt coatings; a few gray silty clay loam pockets or seams; abrupt irregular lower boundary with a few pockets or tongues extending to depths of 36 to 46 inches; strongly or very strongly acid; range in thickness, 8 to 20 inches.

B_{3m} 24 to 47 inches, mottled gray (10YR 5/1 or 6/1), yellowish-brown (10YR 5/6), light brownish-gray (2.5Y 6/2), and strong-brown (7.5YR 5/6) friable light silty clay loam or heavy silt loam (firm or compact in place); mottles distinct, many, and fine; a few fine, distinct, reddish-brown (5YR 4/4), yellowish-red (5YR 4/6), and light olive-brown (2.5Y 5/6) mottles; weak to moderate fine and medium blocky or platy structure; patchy clay skins; a few to a moderate number of brownish and black concretions and an occasional chert fragment; strongly to very strongly acid; range in thickness, 8 to 28 inches; abrupt irregular lower boundary.

C 47 to 60 inches +, mottled yellowish-brown (10YR 5/6), gray (10YR 5/1 or 6/1), red (2.5YR 4/6), yellowish-red (5YR 4/6), and strong-brown (7.5YR 5/6) firm silty clay loam or silty clay; mottles prominent, many, and medium to coarse; moderate fine or medium blocky structure; patchy to continuous clay skins; a few to a moderate number of angular chert fragments; strongly acid.

About 20 percent of this soil is gently sloping. It includes a few areas of the Sango, Guthrie, and Lobelville soils too small to delineate separately.

Surface runoff in many places is very slow to slow, but in some places the soil is ponded. Internal drainage is slow. During winter and spring the soil is wet much of the time and remains so for long periods when once saturated. The water-supplying capacity is moderate except during extended dry periods, when the soil becomes droughty.

The soil is strongly to very strongly acid and low in plant nutrients and organic matter. Permeability is moderate in the surface and slow in the subsoil. The fragipan (B_{3m}) restricts movement of water and air and penetration of plant roots. The soil is easy to work and keep in good tilth (fig. 9). The hazard of erosion is slight. About 65 percent of this soil is under mixed hardwoods forest consisting chiefly of white and willow oaks, sweetgum, blackgum, and maple.

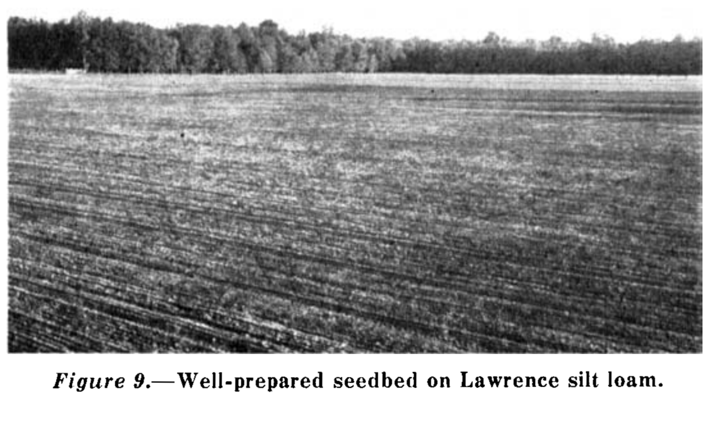

Figure 9.—**Well-prepared seedbed on Lawrence silt loam.**

Lee series

The Lee series consists of gray poorly drained soils of the bottom lands. They have formed from recent alluvial material washed from soils on uplands underlain mainly by low-grade limestone. The Dickson, Mountview, Baxter, and Bodine are the soils from which most of the alluvial material was derived.

The Lee soils have a very friable silt loam surface layer that overlies very friable to friable silt loam or silty clay loam. The profile is strongly or very strongly acid throughout.

The Lee soils typically occur on the outer rim of stream bottoms. Along some of the smaller streams and intermittent drainageways, the soils may occupy the entire flood plain. A considerable acreage occurs along small drainageways, at the base of slopes, and in small upland depressions.

This series has only one soil in Coffee County. The soil occurs mostly in the Dickson-Mountview-Lobelville soil association. A small acreage occurs in other soil associations. The soil is of limited extent and minor agricultural importance.

Lee soils are associated with the Lobelville soils of the bottom lands, the Robertsville soils of the terrace lands, and Guthrie and Lawrence soils of the uplands. They are grayer throughout and more poorly drained than the Lobelville soils. They differ from the Robertsville, Guthrie, and Lawrence soils mostly in being younger and more weakly developed. The Lee soils are similar to the Prader soil in drainage and position occupied but differ from the Prader in kind of parent material.

Lee silt loam (Lb) (Capability unit IIIw–2).—A profile of this soil is described as follows:

A_1 0 to 6 inches, dark-gray (10YR 4/1) or very dark gray (10YR 3/1) very friable silt loam; weak fine granular structure; strongly acid.

C_{g1} 6 to 14 inches, light brownish-gray (10YR 6/2 or 2.5Y 6/2) very friable silt loam; a few, fine, faint, gray and light yellowish-brown organic stains or mottles; weak fine granular structure; strongly or very strongly acid.

C_{g2} 14 to 24 inches, light brownish-gray (10YR 6/2 or 2.5Y 6/2) or light-gray (10YR 7/1 or 7/2) friable silt loam or light silty clay loam; a few fine, faint, light yellowish-brown (10YR 6/4) and brownish-yellow (10YR 6/6) mottles in the upper part and a moderate number in the lower part; weak fine subangular blocky structure; strongly or very strongly acid.

C_{g3} 24 to 42 inches +, mottled light-gray (10YR 7/1) and yellowish-brown (10YR 5/4 or 5/6) or brownish-yellow (10YR 6/6) friable silt loam or silty clay loam or firm silty clay; mottles distinct, many, and fine; weak fine subangular blocky structure; strongly or very strongly acid; gradual transition to extremely variable mixtures of gravel, silty clay, silty clay loam, and sandy material.

In cultivated areas the plow layer, or upper 6 to 8 inches of the surface soil, is gray to dark gray.

Approximately 55 acres differ from the soil described chiefly in having formed in alluvium washed from phosphatic limestone soils. A small part of the soil is phosphatic, and 1- to 3-inch chert fragments are on the surface and mixed through the profile. This phosphatic inclusion is slightly acid. It is associated with the Lindside soils in the Armour-Huntington-Lindside soil association.

Surface runoff is very slow to slow, and internal drainage is slow. The soil is moderately permeable in the surface soil. The subsoil is slowly permeable, largely because of a fluctuating water table that stays high most of the time. During wet seasons, the soil is waterlogged and is ponded in the depressions. A few small areas are swampy most of the time. The soil is strongly to very strongly acid, moderate in organic matter, and low in plant nutrients. It has good to fair workability when moisture conditions are favorable. The soil is susceptible to flooding, and many areas are continually receiving deposits of soil material. Drainage by means of open ditches and bedding would be expected to broaden the use suitability of the soil.

An estimated 60 percent of the Lee soil remains in forest, and 40 percent is cleared. The native forest is chiefly water-tolerant hickory, maple, sweetgum, white oak, ash, willow, sycamore, and alder. The largest part of the cleared acreage is used for pasture; only a small part is used for corn and hay.

Lindside series

The Lindside series consists of somewhat poorly drained to moderately well drained soils of the bottom lands. They are on recent alluvium washed from upland soils, which were derived mostly from limestone residuum.

The Lindside soils have a friable silt loam to light silty clay loam surface layer, and a friable to firm silty clay loam or silty clay underlying layer. The profile is slightly acid except in the bottom part of the underlying layer.

These soils vary mostly in thickness of the surface layer, color and degree of mottling, consistence, and texture in the deeper part of the profile. The depth of the prominently mottled layer ranges from 16 to 24 inches in most places.

Lindside soils are of limited extent but are of local agricultural importance. The principal areas are in the Armour-Huntington-Lindside and the Bodine-Dellrose soil associations.

Lindside soils occur on flood plains in association with the well-drained Huntington soils. They are similar to Lobelville and Hamblen soils in position and have the same drainage. They differ from those soils in color, degree of mottling, and origin of parent materials.

Lindside silt loam, phosphatic phase (Lf) (Capability unit IIw–1).—The following describes a profile of this soil in a cultivated area:

A_p 0 to 10 inches, brown (10YR 4/3), dark-brown (10YR 3/3), dark grayish-brown (10YR 4/2), or very dark grayish-brown (10YR 3/2) friable silt loam; weak fine granular structure; slightly acid or neutral.

A_1 10 to 18 inches, brown (10YR 4/3) to very dark grayish-brown (10YR 3/2) friable silt loam to light silty clay loam; moderate fine granular or weak very fine subangular structure; a few, fine, faint, light brownish-gray (10YR 6/2 or 2.5Y 6/2) mottles; slightly acid or neutral.

C_{g1} 18 to 30 inches, mottled grayish-brown (10YR 5/2) to very dark grayish-brown (10YR 3/2), gray (10YR 6/1) to dark-gray (10YR 4/1), and yellowish-brown (10YR 5/6) or light olive-brown (2.5Y 5/4) friable to firm silty clay loam or light silty clay; mottles distinct, many, and fine; weak fine subangular blocky structure; slightly acid.

C_{g2} 30 to 45 inches +, mottled light-gray (10YR 7/1) or gray (2.5Y 5/0), dark-gray (10YR 4/1) or dark grayish-brown (2.5Y 4/2), brownish-yellow (10YR 6/8), and reddish-brown (5YR 4/4) firm (plastic when wet) gritty silty clay loam or silty clay; mottles prominent, many, and fine; no well-defined structure; many finely divided pieces of chert gravel; a few black stains and streaks, and a few gray clay pockets; grades to stratified layers of gravel intermixed with silt loam, sand, and clay.

Included is 85 acres that differs principally in occupying local alluvial-colluvial positions well above the present flood plains. Also included is about 110 acres that differs mainly in being slightly better drained, in occupying level to gently sloping areas on the outer edge of the flood plains, and in being compacted and plastic at an average depth of 20 inches and browner and less mottled in the deeper part of the profile. In these included areas the soil is less productive, more difficult to work and conserve, and lower in water-supplying capacity.

Surface runoff for Lindside silt loam, phosphatic phase, is very slow to slow, and internal drainage is slow. The surface soil is moderately permeable; the subsoil is slowly permeable. The low areas of the soil are ordinarily saturated because of an alternately high and low water table. Consequently, growth of plant roots is restricted. The soil is high in organic matter and plant nutrients and very high in water-supplying capacity. It is slightly acid to neutral. Its phosphorus content is mostly high because the alluvium in which the soil formed has washed from soils derived largely from phosphatic limestone materials. Practically all areas are susceptible to periodic flooding that limits the use of the soil. Control of scouring by floodwater and control of runoff from higher lying slopes are the chief problems in conserving the soil.

Lindside silt loam, local alluvium phase (Le) (Capability unit IIw–1).—This soil differs from Lindside silt loam, phosphatic phase, chiefly in position and parent material. It has formed on slopes of 1 to 3 percent slopes, chiefly in depressions and along small drainageways.

The parent material for this soil has washed or drifted from soils derived from nonphosphatic limestone materials. The Cumberland, Cookeville, Decatur, Pembroke, Etowah, Waynesboro, Baxter, and Hermitage soils have contributed most of the soil material. The soil is associated with the well-drained Emory soil.

Profile of Lindside silt loam, local alluvium phase:

A_1 0 to 14 inches, dark grayish-brown (10YR 4/2) or brown (10YR 4/3) friable silt loam; medium or slightly acid.

C_1 14 to 26 inches, yellowish-brown (10YR 5/6) or light yellowish-brown (10YR 6/4) friable silt loam or silty clay loam; a few to a moderate number of fine, faint, light-gray (10YR 7/1), brown (10YR 4/3), and pale-yellow (2.5Y 7/4) mottles; medium or slightly acid.

C_2 26 to 40 inches +, mottled light-gray (10YR 7/1), light yellowish-brown (10YR 6/4), brownish-yellow (10YR 6/6), and strong-brown (7.5YR 5/8) friable to firm silty clay loam; mottles fine, distinct, and many; contains a moderate number to many black and reddish-brown stains and concretions.

The color of the surface layer varies more than that of Lindside silt loam, phosphatic phase. It varies from grayish brown to dark brown or reddish brown where materials have washed from eroded and severely eroded slopes. Areas occurring in depressions are ponded in winter and early in spring for periods of several days to several weeks, whereas those areas along the small drainageways are flooded for only short periods.

Lindside cherty silt loam, phosphatic phase (Ld) (Capability unit IIw–1).—This soil differs from Lindside silt loam, phosphatic phase, chiefly in chert content. Chert fragments ranging mostly from ½ to 3 inches in diameter are on the surface and distributed throughout the soil. Most of the soil occurs in long narrow areas along the smaller streams in the Armour-Huntington-Lindside and the Bodine-Dellrose soil associations. In places small spots consist almost entirely of chert gravel because overflow waters have removed finer soil material or because runoff has brought coarse material down from adjacent slopes. The soil further differs from Lindside silt loam, phosphatic phase, in being less productive and slightly more difficult to work because of its chert content.

Lindside cherty silt loam, local alluvium phosphatic phase (Lc) (Capability unit IIs–1).—This soil differs from Lindside silt loam, phosphatic phase. It is more difficult to work because it contains more chert; is less productive; is more variable in phosphorus content; and is less susceptible to flooding. Chert fragments ranging mostly from ½ to 6 inches in diameter are on the surface and distributed throughout the soil. The soil occurs on slopes of 0 to 3 percent. It is in small narrow areas along intermittent drainageways in the V-shaped valleys and at the base of slopes. The alluvium has washed and rolled chiefly from the Dellrose and Bodine soils. Seepage waters bring materials down from the higher lying soils that were derived from phosphatic limestone.

Lobelville series

The Lobelville series consists of somewhat poorly drained to moderately well drained soils of bottom lands. They have formed on nearly level flood plains in young alluvium washed from upland soils underlain chiefly by low-grade limestone. Most of the alluvium has washed from Dickson, Mountview, Sango, Baxter, and Bodine soils.

The Lobelville soils have a friable silt loam surface soil. Their friable silt loam or silty clay loam substratum is underlain by highly variable material that usually contains considerable sand and gravel. The profile is medium to strongly acid and mottled throughout.

The surface soil ranges from light brownish gray to dark grayish brown or dark gray. The depth to mottles varies from 10 to 24 inches. In most places, however, the soils are faintly mottled at depths of 12 to 15 inches, and the mottles are more prominent with increasing depth. The material below depths of 20 to 24 inches is extremely variable in texture and consistence. In some places it is relatively chert-free heavy silty clay loam. In other places it may be a mixture of sand, gravel, and silty material.

The Lobelville soils are widely distributed throughout the county and are of moderate extent and agriculturally important. The principal areas occur in the Dickson-Mountview-Lobelville, the Mountview-Cookeville-Pembroke, and the Mountview-Baxter-Lobelville soil associations.

Lobelville soils are associated with the Lee, Greendale, Humphreys, Captina, Taft, and Robertsville soils. The Lobelville soils are somewhat poorly drained to moderately well drained, the Lee soils are poorly drained, and the Greendale soils are moderately well drained to well drained. The Lobelville soils are less well developed and younger than the Humphreys, Captina, Taft, and Robertsville soils. The Lobelville soils occupy positions similar to those of the Lindside and Hamblen soils and have the same drainage, but they differ chiefly in being more acid, more silty throughout, and less productive.

Lobelville silt loam (Lh) (Capability unit IIw–1).—The following describes a profile of this soil.

A_1 0 to 12 inches, grayish-brown (10YR 5/2) or dark grayish-brown (10YR 4/2) friable silt loam; a few fine, faint, light-gray (10YR 7/2), light brownish-gray (10YR

6/2), and yellowish-brown (10YR 5/4) stains or mottles; weak fine granular structure; an occasional to a few fine pieces of chert gravel or angular fragments; medium to strongly acid.

C_{g1} 12 to 22 inches, light yellowish-brown (10YR 6/4) or pale-brown (10YR 6/3) friable silt loam or light silty clay loam; a few fine, faint, light brownish-gray (10YR 6/2) and yellowish-brown (10YR 5/4) mottles that become more pronounced with increasing depth; moderate fine granular structure to weak very fine subangular blocky structure; a few fine chert fragments or pieces of gravel; strongly acid.

C_{g2} 22 to 36 inches +, light yellowish-brown (10YR 6/4) to light brownish-gray (10YR 6/2) friable silty clay loam; many fine, faint, yellowish-brown (10YR 5/6) and gray (10YR 6/1) or light-gray (10YR 7/2) mottles; a few soft, brown concretions and a moderate number of fine pieces of chert gravel and angular fragments; strongly acid; underlain by highly variable material that usually contains considerable sand and gravel.

Included is about 90 acres of a well-drained soil that has a brown surface soil and yellowish-brown subsurface layer and is more productive. A few small areas of the poorly drained Lee soil and somewhat poorly drained Taft soils are also included.

Surface runoff from Lobelville silt loam is very slow to slow, and internal drainage is slow to medium. The water table is alternately high and low, but the mottling in the subsoil indicates that the water table is high a large part of the time. Permeability is moderate in the surface soil and moderately slow in the subsoil. When not saturated with water, the soil is easily penetrated by plant roots. It is medium to strongly acid, moderate in organic matter, medium in plant nutrients, and high in water-supplying capacity. It has very good workability. Floodwaters have cut many small channels along many of the streams and intermittent drainageways. A considerable part of the finer soil material has been lost from areas adjacent to these channels. Channel improvement would help save most of the soil from damage by floodwaters.

Lobelville silt loam, local alluvium phase (Lk) (Capability unit IIw–1).—This soil differs from Lobelville silt loam chiefly in position. It occurs in small areas along small drainageways, in narrow elongated strips at the base of slopes, and in small upland depressions. The local alluvium has washed principally from the Mountview, Dickson, Sango, and Baxter soils. The soil, below depths of 24 to 28 inches, ranges from a friable silt loam to a friable but compact silty clay loam, and it generally contains less chert and sand than Lobelville silt loam. Areas of this mapping unit are widely distributed in the Dickson-Mountview-Lobelville, the Mountview-Cookeville-Pembroke, and the Mountview-Baxter-Lobelville soil associations. Although not extensive, this soil is agriculturally important.

Lobelville cherty silt loam, local alluvium phase (Lg) (Capability unit IIs–1).—This soil is of little agricultural importance because of its small area. It differs from Lobelville silt loam chiefly in chert content and position but also in being less productive. Angular chert fragments ½ to 3 inches or more in diameter are on the surface and distributed through the profile in numbers that materially interfere with tillage. The soil occurs in narrow V-shaped valleys along drainageways and at the base of slopes, chiefly in association with the Bodine, Baxter, Mountview, and Greendale soils. The slopes range from 0 to 3 percent, but most of them are between 0 and 2 percent.

The surface soil is light brownish-gray or grayish-brown very friable cherty silt loam. The subsurface layers are mottled light brownish-gray and light yellowish-brown, friable, cherty silt loam or light silty clay loam.

Made land

Made land (Ma) (Capability unit VIIs–1) consists of areas that have been filled with earth, trash, or both, and smoothed. It occurs in small areas, most commonly in and around cities or towns. This inextensive miscellaneous land type has little or no agricultural value.

Mimosa series

The Mimosa series consists of well-drained upland soils that developed in residuum from phosphatic argillaceous limestone. They occupy gentle to strong slopes and have formed under a mixed hardwoods forest that included a high proportion of oak, hickory, and black walnut.

Mimosa soils have a dark-brown or brown to strong-brown or reddish-brown friable to firm or very firm surface soil. Their strong-brown to brown or reddish-brown very firm to friable or firm subsoil is variegated in the lower part. They have a medium content of phosphorus.

The surface soil ranges from a dark grayish brown to dark brown in color, from a heavy silt loam to silty clay loam in texture, and from 4 to 10 inches in thickness. The B_2 and B_3 horizons may vary from yellowish brown or brownish yellow to yellowish red, but the predominant color is strong brown. A thin brown or reddish-brown B_1 horizon is distinguishable in a few areas. The depth to bedrock ranges from 3 to 8 feet and averages about 6 feet. There are occasional outcrops of bedrock.

Mimosa soils occur in small to medium-sized areas in the Bodine-Dellrose soil association. They are not extensive, but are of moderate agricultural importance in the vicinity of Beechgrove and Noah, where the principal areas occur.

The Mimosa soils are associated with the Armour and Dellrose soils and phases of the Mimosa-Baxter-Colbert very rocky soils. The Mimosa soils occupy gentle to strong slopes, the Armour soils the terraces, and the Dellrose soils the colluvial lands. The phases of Mimosa-Baxter-Colbert very rocky soils are on the uplands. Mimosa soils are similar to the Talbott soil but differ chiefly in being more phosphatic.

Mimosa silty clay loam, eroded sloping phase (Mk) (Capability unit IIIe–4).—A profile of this soil in a cultivated area is described as follows:

A_p 0 to 6 inches, dark-brown (10YR 4/3) or brown (10YR 5/3) friable silty clay loam or heavy silt loam; weak fine granular structure or weak very fine subangular blocky structure; medium to strongly acid; range in thickness, 4 to 8 inches.

B_2 6 to 30 inches, strong-brown (7.5YR 5/6) firm or very firm silty clay or clay; plastic when wet and very hard when dry; a moderate number of fine, faint, yellowish-brown (10YR 5/4 and 5/6) to brownish-yellow (10YR 6/6) variegations; continuous clay skins; moderate number of black concretions or segregations 1.0 millimeter in diameter and a few finely divided angular chert fragments; strongly acid; range in thickness, 12 to 30 inches.

B_3 30 to 42 inches, variegated strong-brown (7.5YR 5/6), yellowish-brown (10YR 5/4), and brownish-yellow (10YR 6/6) very firm clay; plastic when wet and very hard when dry; variegations distinct, many, and fine; a few, fine, faint, light-gray (10YR 7/1 and 7/2) and light brownish-gray (10YR 6/2) variegations; blocky structure; continuous clay skins; a few black concretions or segregations and finely divided chert fragments; strongly acid; range in thickness, 8 to 20 inches.

C 42 to 60 inches +, variegated brownish-yellow (10YR 6/6), light-gray (10YR 7/1), strong-brown (7.5YR 5/6), and pale-yellow (2.5Y 7/4) very firm clay; plastic when wet and very hard when dry; variegations distinct, many, and fine; a few fine, prominent red (2.5YR 4/6) or yellowish-red (5YR 4/6) variegations; moderate medium and coarse blocky structure; patchy clay skins on vertical faces of the structure beds; a few to a moderate number of fine angular chert fragments and black to reddish-brown stains; strongly acid.

Surface runoff is rapid, and internal drainage is slow. Permeability is moderately slow in the surface soil and slow in the subsoil. The soil is medium to strongly acid, medium in supply of plant nutrients, and moderate in organic matter and water-supplying capacity. Workability is only fair, and good tilth is difficult to maintain because the soil has a very firm clay subsoil and a thin surface soil. The hazard of erosion is high.

Practically all areas of the soil have been cleared and cultivated. Approximately 15 percent is used for crops and 70 percent for pasture. The rest is idle or is reverting to forest or thickets that include a large proportion of locust, cedar, hackberry, poplar, hickory, and redbud.

Mimosa silty clay loam, eroded gently sloping phase (Mh) (Capability unit IIIe–4).—This soil differs from Mimosa silty clay loam, eroded sloping phase, in having a somewhat more uniform and thicker surface soil or plow layer. Included is approximately 20 acres of Mimosa cherty silt loam, gently sloping phase, which is not mapped separately in this county.

Mimosa silty clay, severely eroded sloping phase (Mf) (Capability unit IVe–2).—This soil differs from Mimosa silty clay loam, eroded sloping phase, chiefly in having a firmer and more yellowish surface soil and poorer tilth and in being somewhat shallower to bedrock. Included with this soil are about 50 acres with slopes ranging from 2 to 5 percent.

Mimosa cherty silt loam, eroded sloping phase (Mb) (Capability unit IIIe–4).—This soil differs from Mimosa silty clay loam, eroded sloping phase, chiefly in having a thin covering of friable, cherty, local colluvium that rolled onto it from higher lying Dellrose and Bodine soils. The friable cherty material ranges from 4 to 18 inches in thickness but averages about 12 inches. The chert content varies considerably from place to place. The larger chert fragments range from 4 to 6 inches in diameter. Most of them are on the surface, but some of the smaller fragments are distributed through the upper part of the profile.

The following describes a profile of Mimosa cherty silt loam, eroded sloping phase, in a cultivated area:

A_p 0 to 6 inches, dark-brown (10YR 4/3) to brown (10YR 5/3) friable cherty silt loam or light silty clay loam; weak fine granular structure.

B_1 6 to 12 inches, brown (7.5YR 4/4) or reddish-brown (5YR 4/4) friable to firm cherty silty clay loam; weak to moderate very fine and fine subangular blocky structure.

B_2 12 to 36 inches, strong-brown (7.5YR 5/6) very firm clay or silty clay; plastic when wet; moderate number of fine, faint, yellowish-brown (10YR 5/4 to 5/6) or brownish-yellow (10YR 6/6) variegations; strong fine and medium blocky structure.

B_3 36 to 48 inches, variegated brownish-yellow (10YR 6/6), yellowish-brown (10YR 5/6 to 5/4), and strong-brown (7.5YR 5/6) very firm clay; most of the variegations are fine and faint, but there are a few, fine, faint, light-gray (10YR 7/2), yellow (10YR 7/6), and yellowish-red (5YR 4/6) variegations; strong medium blocky structure.

C 48 to 60 inches +, variegated brownish-yellow (10YR 6/6), light-gray (10YR 7/1), pale-yellow (2.5Y 7/4), and strong-brown (7.5YR 5/6) or yellowish-red (5YR 4/6) very firm clay; variegations many, fine, and distinct; moderate to strong medium and coarse blocky structure.

The soil varies mainly in the depth, texture, and color of the friable cherty layers. Where the cherty colluvium has originated predominantly from Bodine soils, the surface soil or plow layer varies from a grayish brown or brown to dark grayish brown.

This soil has better tilth than Mimosa silty clay loam, eroded sloping phase, and is somewhat better suited to and more productive of row crops.

Mimosa cherty silt loam, eroded strongly sloping phase (Mc) (Capability unit IVe-2).—This soil differs from Mimosa cherty silt loam, eroded sloping phase, chiefly in having a somewhat more variable and slightly less thick friable cherty surface soil. A few shallow gullies and occasional bedrock outcrops are present.

Mimosa cherty silty clay loam, severely eroded sloping phase (Md) (Capability unit IVe-2).—This soil differs from Mimosa cherty silt loam, eroded sloping phase, chiefly in having a friable to firm surface soil, which is brown to dark yellowish brown in most places. Because of the firmer consistence, accumulation of chert fragments on the surface, moderate water-supplying capacity, and poor tilth, the soil is less well suited to row crops than Mimosa cherty silt loam, eroded sloping phase. Included is one very small area with slopes of 2 to 5 percent.

Mimosa cherty silty clay loam, severely eroded strongly sloping phase (Me, Mg, and Mm) (Capability unit VIe-1).—This soil differs from Mimosa cherty silt loam, eroded sloping phase, chiefly in having a firmer and thinner surface soil and generally more and larger chert fragments on the surface.

The surface soil varies from dark-brown or brown friable cherty silt loam in the less eroded spots to yellowish-brown, strong-brown, or reddish-brown firm or very firm cherty silty clay in the more severely eroded spots. A few shallow gullies have formed, and a few bedrock outcrops appear. About 60 acres have a moderate number of shallow gullies. Many of these gullies can be obliterated by tillage. A few deep gullies have formed that cannot be crossed with farm machinery.

Included with this soil are severely eroded, strongly sloping areas of Mimosa silty clay. Also included are eroded, strongly sloping areas of Mimosa silty clay loam.

Mimosa, Baxter, and Colbert very rocky soils, strongly sloping phases (Mn) (Capability unit VIe–1).—These soils make up an undifferentiated soil group characterized by numerous limestone outcrops and loose fragments that occupy 10 to 25 percent of the surface. The slopes range mostly from 12 to 20 percent, but in some areas they range from only 3 to 12 percent. The soil material around the rock outcrops has weathered from limestone and is variable in color, texture, consistence, depth, and parent material.

In the Bodine-Dellrose soil association, areas of this mapping unit have formed from phosphatic limestone materials, similar to the parent materials of the Mimosa and Colbert soils. In many other places, areas of this mapping unit have formed from cherty limestone materials that closely resemble the parent materials of the Baxter soils. Some areas, however, consist of Talbott soil material. In the Rockland-Bouldery colluvial land soil association, this mapping unit is associated chiefly with Rockland, moderately steep, and Rockland, sloping. The soil material has weathered from argillaceous limestone consisting principally of Colbert soil material and smaller areas of Talbott soil material. This mapping unit therefore does not occur as a complex of all the soils specified in its name. All areas have one soil, more areas have two soils. No area, however, has all three.

The following profile descriptions are representative of moderately eroded areas of the three principal kinds of soil material that comprise the Mimosa, Baxter, and Colbert very rocky soils:

1. Mimosa phosphatic soil material:
   - 0 to 6 inches, brown (10YR 5/3) or dark-brown (10YR 4/3) friable silty clay loam or heavy silt loam.
   - 6 to 12 inches, brown (7.5YR 4/4), strong-brown (7.5YR 5/6), or reddish-brown (5YR 4/4) firm silty clay; plastic when wet.
   - 12 to 36 inches +, strong-brown (7.5YR 5/6) or yellowish-brown (10YR 5/4) very firm clay; very plastic when wet; a few to a moderate number of fine, distinct, brownish-yellow (10YR 6/6), gray (10YR 6/1), and light-gray (10YR 7/1) mottles.
2. Baxter cherty soil material:
   - 0 to 6 inches, brown (10YR 4/3) or grayish-brown (10YR 5/2) friable cherty silt loam.
   - 6 to 14 inches, yellowish-brown (10YR 5/4) or reddish-yellow (7.5YR 6/6) friable cherty silty clay loam.
   - 14 to 36 inches+, red (2.5YR 4/6), dark-red (2.5YR 3/6), or yellowish-red (5YR 4/6 to 5/6) firm cherty silty clay loam, silty clay, or clay; a few, fine, distinct or prominent, reddish-yellow, gray, and brownish-yellow mottles.
3. Colbert soil material:
   - 0 to 4 inches, grayish-brown (10YR 5/2) or dark grayish-brown (2.5Y 4/2) firm silty clay.
   - 4 to 9 inches, brownish-yellow (10YR 6/6), olive-brown (2.5Y 4/4), or light olive-brown (2.5Y 5/4) very firm silty clay or clay; plastic when wet.
   - 9 to 14 inches, mottled yellow, gray, light olive-brown, and reddish-brown or yellowish-red very firm clay; very plastic when wet.

The thickness of soil material over bedrock ranges mostly from 0 to 3 feet, but in a few places bedrock may be at depths of 5 or 6 feet. The surface soil varies from silt loam to clay, depending on the parent material and the degree of erosion. Erosion classes represented in the group are uneroded or slightly eroded, eroded, and severely eroded. A few gullies have developed in the severely eroded areas.

Surface runoff from this mapping unit is rapid, and internal drainage is slow. Permeability is slow in the surface soil and slow to very slow in the underlying material. The soils are medium in plant nutrients and low in organic matter. Their water-supplying capacity is low. Workability is very poor because the soils are stony and the slopes are strong. Tilth is generally poor because of shallow depth of the soils, high clay content, and firm consistence.

The original forest was chiefly mixed hardwoods and scattered cedar. Most forest areas have been cut over. Oak, hickory, locust, redbud, poplar, walnut, and cedar in thin stands are the principal trees. Some areas that were at some time cleared now support thickets of locust, hackberry, poplar, plum, and hickory; others support mainly cedars. Cleared areas are used chiefly for unimproved pasture, but a very small part is used for crops. A large part of the uncleared acreage is in woodland pasture.

Mimosa, Baxter, and Colbert very rocky soils, moderately steep phases (Mo) (Capability unit VIIs–1).—The soils of this undifferentiated soil group have steeper slopes than the strongly sloping phases. The slopes range mostly from 20 to 60 percent. The soil material averages slightly shallower to bedrock. On the surface, rock outcrops and loose rock fragments are normally somewhat more abundant than on the strongly sloping phases.

Most of this mapping unit is either in unimproved pasture or in pastured woodland. The forested areas have chiefly cedars or thin stands of mixed hardwoods and scattered cedars. Pastures are droughty, and control of weeds, briers, and bushes is very difficult because outcrops of bedrock make mowing impractical.

Monongahela series

The Monongahela series consists of moderately well drained soils that have a fragipan. They occur on medium-high to high stream terraces. They have developed in sediments washed from upland soils derived mainly from residual materal from acid sandstone, but partly from residual material from limestone.

The Monongahela soils have a dark-gray to light yellowish-brown very friable loam surface soil. Their subsoil is yellowish-brown friable loam or light yellowish-brown to light olive-brown friable clay loam. A compacted fragipan layer is in the profile at an average depth of about 28 inches.

The texture of the surface soil ranges from loam to fine sandy loam. In disturbed, or cultivated, areas, the surface soil is grayish brown to light yellowish brown. The B and C horizons vary considerably in texture and range from silty clay loam to clay loam or sandy clay loam. Where alluvium in which the soil was formed is only 3 to 4 feet deep to limestone residuum, the B horizon is generally finer in texture. The B horizon varies from light yellowish brown or yellowish brown to light olive brown. The depth to the fragipan (B_{3m}) ranges mostly from 24 to 30 inches. The profile also varies somewhat in drainage, as the mottling indicates.

The Monongahela soils occur mostly in the Holston-Monongahela-Tyler soil association. They make up an important part of that association, but small acreages are also in the Dickson-Mountview-Lobelville and the Waynesboro-Cumberland-Hamblen soil associations. Approximately 60 percent of the acreage of the Monongahela soils is uneroded or slightly eroded, and 40 percent is moderately eroded. An estimated 30 percent remains in mixed hardwoods forest, chiefly oak, hickory, and gum.

Monongahela soils are associated with the Holston, Tyler, and Purdy soils. They are less well drained than the Holston soils and have a fragipan that is missing in the Holston soils. The Monongahela soils are better drained and mottled only in the lower layers of the subsoil. The Tyler soils, in contrast, are somewhat poorly drained and mottled throughout the subsoil. The Monongahela soils are also associated with the Waynesboro and Nolichucky soils and with the Sequatchie and Whitwell soils. The Monongahela soils occupy level and gently sloping relief on broad ridges and slight depressions of old medium to high stream terraces, the Waynesboro and Nolichucky soils are on the high stream terraces, and the Sequatchie and Whitwell soils are on the low stream terraces. The Monongahela soils are older, less brown, and not so productive as the Sequatchie and Whitwell soils.

Monongahela loam, gently sloping phase (Mr) (Capability unit IIe–4).—A profile of this soil shows the following characteristics:

- A_1 0 to 1 inch, dark-gray (10YR 4/1) very friable loam; weak fine crumb structure; strongly or very strongly acid; range in thickness, ½ to 2 inches.
- A_2 1 to 6 inches, pale-brown (10YR 6/3) very friable loam; weak fine granular structure; strongly or very strongly acid; range in thickness, 4 to 7 inches.
- A_3 6 to 12 inches, light yellowish-brown (10YR 6/4) or pale-brown (10YR 6/3) very friable loam; weak very fine subangular blocky structure; strongly or very strongly acid; range in thickness, 4 to 8 inches.
- B_1 12 to 16 inches, light yellowish-brown (10YR 6/4) or yellowish-brown (10YR 5/4) friable loam; weak fine subangular blocky structure; strongly acid; range in thickness, 2 to 6 inches.
- B_2 16 to 28 inches, light yellowish-brown (10YR 6/4) to light olive-brown (2.5Y 5/4) friable light clay loam; a few faint, fine, light brownish-gray (2.5Y 6/2) mottles; moderate fine blocky structure; strongly acid.
- B_{3m} 28 to 39 inches, mottled light-gray (10YR 7/1) or light brownish-gray (2.5Y 6/2), yellowish-brown (10YR 5/6), brownish-yellow (10YR 6/6) or light olive-brown (2.5Y 5/4), and strong brown (7.5YR 5/8) friable (compact in place) light clay loam, fine sandy loam, or fine sandy clay loam; mottles prominent, many, and fine; structureless (massive) in place but if removed shows weak to moderate medium blocky or platy structure; some fine chert gravel and a few small quartzite pebbles; strongly or very strongly acid; range in thickness, 8 to 24 inches.
- C 39 to 60 inches +, mottled light-gray (10YR 7/1), yellowish-brown (10YR 5/6), brownish-yellow (10YR 6/6), and strong brown (7.5YR 5/8) firm clay or sandy clay loam; many, fine to medium, prominent mottles; a few yellowish-red (5YR 5/6) to dark-red (2.5YR 3/6) fine, prominent mottles; weak to moderate medium blocky structure; a few to a moderate number of fine chert gravel and quartzite pebbles; strongly or very strongly acid; underlain by limestone residuum at variable depths but usually at 5 to 8 feet.

Fine sandy loam areas and small areas of Holston and Tyler soils are the principal inclusions.

Surface runoff is slow to medium, and internal drainage is slow. The soil above the fragipan (B_{3m}) is moderately permeable, but the fragipan is slowly permeable and there is little plant-root penetration. The soil is strongly to very strongly acid, low in plant nutrients and organic matter, and moderate in water-supplying capacity. The soil has very good workability, and good tilth can be easily maintained.

Monongahela loam, eroded gently sloping phase (Ms) (Capability unit IIe–4).—This soil differs from Monongahela loam, gently sloping phase, in having a grayish-brown to yellowish-brown surface soil 6 to 8 inches thick.

Monongahela loam, level phase (Mp) (Capability unit IIe–4).—This soil differs from Monongahela loam, gently sloping phase, in having very slow surface runoff. There is no hazard of erosion on the 0 to 2 percent slopes of this soil.

Mountview series

The Mountview series consists of well-drained soils of uplands. These soils have developed from a thin mantle of loesslike silt deposited on residuum weathered from cherty limestone.

Mountview soils have a dark grayish-brown, dark-gray, grayish-brown, yellowish-brown, or brown to light yellowish-brown surface soil. They have a light yellowish-brown to yellowish-brown or reddish-brown friable to firm subsoil that is prominently mottled in the lower part.

These soils vary chiefly in depth of the loesslike silt mantle, presence or absence of an incipient fragipan, and the kind of underlying limestone residuum. The thickness of the loesslike material is usually between 18 and 32 inches, but it may range from 12 to 42 inches. The underlying residuum varies from that of the very cherty Fort Payne limestone to that of the moderately cherty Warsaw limestone. Shallow soils of this series have a solum consisting mostly of silty material that grades into cherty limestone.

The Mountview soils are widely distributed throughout most of the county in small, medium, and large areas. They are extensive and agriculturally important in the Dickson-Mountview-Lobelville, the Mountview-Cookeville-Pembroke, and the Mountview-Baxter-Lobelville soil associations. Small areas are widely distributed on the ridgetops in the Bodine-Dellrose soil association. A few small widely separated areas are in the Holston-Monongahela-Tyler and the Waynesboro-Cumberland-Hamblen soil associations.

The Mountview soils are associated with the Dickson, Cookeville, Pembroke, Baxter, and Bodine soils. They differ from the Dickson soils chiefly in lacking the fragipan and in occurring on a more sloping and dissected landscape. The Mountview soils have a less red subsoil than the Cookeville soils. They are not so productive as the Pembroke soils. The Mountview soils are cherty in the lower layers, whereas the Baxter soils are cherty throughout.

An estimated 70 percent of the Mountview soils has been cleared and is now being cultivated. Approximately 90 percent of the cleared acreage is eroded, and 10 percent is severely eroded. The forested areas have a growth of mixed hardwoods consisting chiefly of red, white, post, and blackjack oaks and hickory.

Mountview silt loam, gently sloping phase (Mt) (Capability unit IIe–3).—The following describes a profile of this soil in a forested area:

- A_{00} and A_0 1 to 0 inch, forest litter and leaf mold; range in thickness, 0 to 1 inch.
- A_1 0 to 1 inch, dark-gray (10YR 4/1) or gray (10YR 5/1) very friable silt loam; weak fine crumb structure; very strongly acid; range in thickness, ½ to 2 inches.
- A_2 1 to 7 inches, pale-brown (10YR 6/3) or light yellowish-brown (10YR 6/4) very friable silt loam; weak fine granular structure; strongly or very strongly acid.
- A_3 7 to 10 inches, light yellowish-brown (10YR 6/4) very friable silt loam; weak very fine subangular blocky structure; strongly acid; range in thickness, 1 to 4 inches.
- B_1 10 to 14 inches, light yellowish-brown (10YR 6/4) or yellowish-brown (10YR 5/4) friable silt loam or light silty clay loam; weak very fine or fine subangular blocky structure; some patchy faint clay skins or silt coatings; strongly acid.
- B_2 14 to 30 inches, yellowish-brown (10YR 5/4) friable silty clay loam; a few fine, faint, light brownish-gray (10YR 6/2) and pale-brown (10YR 6/3) variegations or faint coatings; moderate fine to medium subangular structure; patchy clay skins; a few finely divided chert fragments and small brownish concretions; strongly acid.
- B_3 30 to 36 inches, yellowish-brown (10YR 5/4) firm silty clay loam; a moderate number to many fine to medium, prominent, pale-brown (10YR 6/3), light brownish-gray (10YR 6/2 or 2.5Y 6/2) and reddish-brown (2.5YR 4/4), yellowish-red (5YR 4/6), or strong-brown (7.5YR 5/6) variegations or mottles; moderate fine and medium subangular blocky or blocky structure; patchy clay skins; more chert fragments and brown concretions than in B_2 horizon; strongly acid; range in thickness, 4 to 12 inches.

C or B_{2b} 36 to 52 inches, variegated red (2.5Y 4/6), yellowish-red (5YR 4/6 or 5/8), strong-brown (7.5YR 5/6), yellowish-brown (10YR 5/4), and light brownish-gray (2.5Y 6/2) firm cherty silty clay loam or silty clay; variegations prominent, many, and medium; moderate or strong fine or medium blocky structure; continuous clay skins; content and size of chert fragments widely variable.

Some small areas of Dickson soil are included with this soil as mapped. Other small areas that are included consist of a soil having a very pale-brown surface soil and a strong-brown to yellowish-red subsoil.

Surface runoff and internal drainage of Mountview silt loam, gently sloping phase, are medium. The soil is strongly to very strongly acid, low in plant nutrients and organic matter in cultivated areas, and moderate in water-supplying capacity. It is moderately permeable. It has excellent workability if good management practices are used.

Mountview silt loam, eroded gently sloping phase (Mu) (Capability unit IIe–3).—This soil differs from Mountview silt loam, gently sloping phase, chiefly in having a dark grayish-brown to yellowish-brown surface soil and very good workability.

Mountview silt loam, sloping phase (Mv) (Capability unit IIIe–3).—In color, texture, consistence, and structure, this soil is similar to Mountview silt loam, gently sloping phase. It differs principally in having stronger slopes. It has good to very good workability. The hazard of erosion is moderate.

Mountview silt loam, eroded sloping phase (Mw) (Capability unit IIIe–3).—This soil differs from Mountview silt loam, gently sloping phase, chiefly in having a dark grayish-brown to yellowish-brown surface soil and in being somewhat shallower to the cherty residuum. It also differs in having generally more rapid surface runoff that encourages further erosion if row crops are grown. The workability of the soil is good.

Mountview silt loam, gently sloping shallow phase (Mx) (Capability unit IIe–2).—This soil differs from Mountview silt loam, gently sloping phase, chiefly in depth of the loesslike material. The silty mantle grades into cherty limestone residuum at an average depth of 16 inches. Finely divided chert fragments are more common than in Mountview silt loam, gently sloping phase.

The profile description that follows is for this soil in a forested area:

A_{00} and A_0 1 to 0 inch, forest litter and leaf mold; range in thickness, 0 to 1 inch.

A_1 0 to 1 inch, dark-gray (10YR 4/1) very friable silt loam; range in thickness, 1 to 2 inches.

A_2 1 to 6 inches, pale-brown (10YR 6/3), light yellowish-brown (10YR 6/4), or yellowish-brown (10YR 5/4) very friable silt loam; range in thickness, 4 to 6 inches.

A_3 6 to 9 inches, light yellowish-brown (10YR 6/4) or yellowish-brown (10YR 5/4) friable silt loam; a few, fine chert fragments; range in thickness, 1 to 4 inches.

B_1 9 to 11 inches, yellowish-brown (10YR 5/4) friable light silty clay loam or heavy silt loam; a few to a moderate number of fine chert fragments.

B_2 11 to 16 inches, yellowish-brown (10YR 5/4 to 5/6) or reddish-yellow (7.5YR 6/6) friable silty clay loam; fine chert fragments, few in the upper part but more numerous in the lower part; gradual irregular lower boundary.

C or B_{2b} 16 to 28 inches +, variegated reddish-yellow (7.5YR 6/6), red (2.5YR 4/6), pale-yellow (2.5Y 7/4), brownish-yellow (10YR 6/6), or yellowish-brown (10YR 5/6) firm cherty or very cherty silty clay loam; variegations many, fine, and prominent.

Included with this soil are areas of other Mountview soils and, in places, small areas of Baxter and Cookeville soils.

This shallow soil has medium surface runoff and medium internal drainage. It is strongly to very strongly acid and low in fertility and organic matter in cultivated areas. Permeability is moderate throughout the soil, and the water-supplying capacity is moderately low. The workability of the soil is excellent. The risk of erosion is slight to moderate.

Mountview silt loam, eroded gently sloping shallow phase (My) (Capability unit IIe–2).—This soil differs from Mountview silt loam, gently sloping shallow phase, chiefly in having a more variably colored surface soil. The present surface soil or plow layer ranges from dark grayish brown in the thicker parts to yellowish brown in the thinner parts. Workability is very good; the erosion hazard is moderate.

Mountview silt loam, sloping shallow phase (Mz) (Capability unit IIIe–2).—This soil differs from Mountview silt loam, gently sloping shallow phase, chiefly in having a wider range in the thickness of the loesslike mantle. The soil has good workability. The hazard of erosion is moderate.

Mountview silt loam, eroded sloping shallow phase (Mza) (Capability unit IIIe–2).—This soil differs from Mountview silt loam, gently sloping shallow phase, in having a shallower and more variably colored surface soil. The plow layer or upper 6 inches of surface soil is friable silt loam that varies from dark grayish brown or brown to yellowish brown. Workability is good, and the risk of erosion is moderate.

Mountview silty clay loam, severely eroded gently sloping phase (Mzb) (Capability unit IIIe–3).—This soil differs from Mountview silt loam, gently sloping phase, in color and texture of the surface soil. The surface soil is light yellowish-brown or yellowish-brown, friable, light silty clay loam.

This soil includes small areas having a dark grayish-brown or grayish-brown friable silt loam surface soil. In these areas erosion losses have not been severe. In other more exposed and shallower spots, the surface soil is a strong-brown to yellowish-red firm silty clay loam.

This soil has good workability. The hazard of further erosion is moderate.

Mountview silty clay loam, severely eroded sloping phase (Mzc) (Capability unit IIIe–3).—This soil differs from Mountview silt loam, gently sloping phase, chiefly in having a more variable and somewhat less friable light yellowish-brown or yellowish-brown surface soil. It also has more variable and somewhat more sloping relief.

In places where the surface soil is thicker, it may be a dark grayish-brown or grayish-brown silt loam. In the shallower and more exposed areas this layer may be a strong-brown to yellowish-red friable to firm silty clay loam. A few small areas have many shallow gullies, some of which cannot be filled by ordinary tillage.

This severely eroded sloping phase has only fair workability. The hazard of further erosion is high.

Mountview silty clay loam, severely eroded gently sloping shallow phase (Mzd) (Capability unit IIIe–2).—This soil differs from Mountview silt loam, gently sloping shallow phase, chiefly in having a yellowish-brown or brown surface soil that normally contains a moderate number of fine, angular chert fragments. Chiefly because of relatively shallow depth, moderate to high erosion hazard, poor to only fair workability, and very low organic-matter content, this soil is somewhat less well suited to crops than Mountview silt loam, gently sloping shallow phase.

Mountview silty clay loam, severely eroded sloping shallow phase (Mze) (Capability unit IVe-1).—This soil differs from Mountview silt loam, gently sloping shallow phase, in having a yellowish-brown friable to firm surface soil. It has a higher chert content and, locally, has fine angular chert fragments scattered over the surface. In a few places the reddish-yellow to yellowish cherty residuum is exposed and a few shallow gullies have formed. The workability of this soil is poor, and the risk of further erosion is high.

A few small widely separated areas have many gullies. Many of these gullies are deep enough to hamper tillage greatly or to make it impractical.

Muskingum series

The Muskingum series consists of moderately coarse textured, shallow to deep, excessively drained soils of the uplands. They have formed under deciduous forest from products weathered from acid sandstone.

The Muskingum soils in this county have a surface soil of loose or very friable stony fine sandy loam or sandy clay loam. Except in a few areas where a yellowish-red subsoil has developed, there is no B horizon. The C horizon consists of loose or very friable stony fine sandy loam or sandy clay loam, the lower part of which is sandstone bedrock or very stony residuum.

In a few places these soils are relatively free of stone, but generally they are stony or very stony. In most places bedrock occurs at depths less than 2 feet; in some places it is as deep as 3 or 4 feet. The bedrock outcrops in many places. A moderate number of sandstone fragments and a very few small white quartzite pebbles are distributed through the profile. In places where the A and C horizons are somewhat thicker than described, a thin B horizon has developed.

The Muskingum series has only one soil mapped in Coffee County. It occurs in the extreme eastern part of the county on the Cumberland Escarpment in the Hartsells-Muskingum soil association. It occupies about 25 percent of this association.

The Muskingum soils are associated on uplands with the Hartsells soils and Rock outcrop. The Muskingum and Hartsells soils developed from similar parent material but the Muskingum soils have a weak, stony AC profile and are sloping to strongly sloping. The Hartsells soils have a moderately well developed, shallow to very deep, stone-free ABC profile and are gently sloping to sloping.

Muskingum stony fine sandy loam, strongly sloping phase (Mzf) (Capability unit VIIs-1).—The following describes a profile of this soil in a forested area:

A_{00} and A_0 1 to 0 inch, forest litter and leaf mold; range in thickness, 0 to 1 inch.

A_1 0 to 1 inch, gray (10YR 5/1) or grayish-brown (10YR 5/2) loose or very friable stony fine sandy loam; weak fine granular structure to structureless (single grain); stained with organic matter; strongly acid; range in thickness, 1 to 2 inches.

A_2 1 to 8 inches, pale-brown (10YR 6/3) or light yellowish-brown (10YR 6/4) loose or very friable stony fine sandy loam; weak fine to medium granular structure; strongly or very strongly acid.

C 8 to 18 inches, light yellowish-brown (10YR 6/4), brownish-yellow (10YR 6/6), or yellowish-brown (10YR 5/6) very friable or friable stony fine sandy loam or sandy clay loam; weak medium subangular blocky structure; very strongly acid.

D 18 inches +, sandstone bedrock or very stony sandstone residuum.

About 35 percent of this mapping unit has slopes that range from 5 to 12 percent. A very small inclusion is eroded.

Muskingum stony fine sandy loam, strongly sloping phase, has rapid surface runoff, internal drainage, and permeability. Because it is shallow to bedrock, the feeding zone for deep-rooted plants is limited. This soil is strongly to very strongly acid. It is low in plant nutrients, organic matter, and water-supplying capacity. It has poor workability. The risk of erosion is high.

Almost all of this soil is in hardwoods of poor quality, mainly white oak, red oak, and hickory. A few small areas that were cleared and farmed have been abandoned and are reverting to forest.

Nolichucky series

The Nolichucky series consists of well-drained, gently sloping to sloping soils on old high stream terraces. These soils have developed from alluvium under mixed hardwoods. This alluvium washed from upland soils that were derived from the residuum of weathered acid sandstone and some limestone.

The Nolichucky soils have a surface soil that is dark grayish brown, dark gray, grayish brown to yellowish brown, reddish yellow or red and very friable to firm. Their subsoil is strong-brown or yellowish-red to red, friable to firm clay loam or sandy clay.

The surface soil of these soils ranges from loam to fine sandy loam. The B horizon ranges from yellowish red in the lower part of the thicker soils on gentle slopes to red or dark red in the thinner soils on the more strongly sloping relief. The B horizon of areas that have 4 feet or less of alluvium is more reddish, firmer, and finer in texture than it is in areas that have a deposit 8 to 10 feet thick. A few quartzite pebbles and pieces of gravel are scattered throughout the profile. In places gravel beds occur at the bottom of the alluvium.

The Nolichucky soils are widely distributed in small and medium areas. Their total area is small. Most of the acreage is in the Holston-Monongahela-Tyler soil association, but some is in the Dickson-Mountview-Lobelville association and the Waynesboro-Cumberland-Hamblen association.

The Nolichucky soils are associated with the Holston and Waynesboro soils. Their subsoil is redder than that of the Holston soils, but it is not so red as the subsoil of the Waynesboro soils. The Nolichucky soils are older than the Waynesboro soils and have a more completely leached A horizon.

About 25 percent of the acreage of the Nolichucky soils is uneroded or slightly eroded, 45 percent is eroded, and 30 percent is severely eroded. Practically all of the uneroded or slightly eroded acreage remains in hardwoods, mainly oak and hickory, with scatterings of poplar, blackgum, walnut, and cedar.

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Nolichucky loam, gently sloping phase (Nb) (Capability unit IIe-3).—The following describes a profile of this soil in a forested area:

A_{00} and A_0 1 to 0 inch, forest litter and leaf mold; range in thickness, 0 to 1 inch.

A_1 0 to 1 inch, dark grayish-brown (10YR 4/2) or dark-gray (10YR 4/1) very friable loam; weak very fine crumb or granular structure; strongly acid.

A_2 1 to 7 inches, light yellowish-brown (10YR 6/4) or yellowish-brown (10YR 5/4) very friable loam; weak fine granular structure; strongly or very strongly acid; range in thickness, 4 to 8 inches.

A_3 7 to 11 inches, yellowish-brown (10YR 5/4) or (10YR 5/6) reddish-yellow (7.5YR 6/8) very friable loam; moderate fine granular or weak very fine subangular blocky structure; strongly or very strongly acid; range in thickness, 2 to 5 inches.

B_1 11 to 16 inches, strong-brown (7.5YR 5/6) or yellowish-red (5YR 5/6) friable heavy loam or light clay loam; weak to moderate fine subangular blocky structure; strongly acid; range in thickness, 3 to 7 inches.

B_2 16 to 36 inches, yellowish-red (5YR 4/6) or red (2.5YR 4/6) friable to firm clay loam; a few, fine, distinct, yellowish-brown (10YR 5/6) or brownish-yellow (10YR 6/6) variegations; moderate fine and medium blocky and subangular blocky structure; patchy to continuous clay skins; a few small quartzite pebbles and pieces of chert gravel; strongly acid.

B_3 36 to 46 inches, red (2.5YR 4/6) or yellowish-red (5YR 4/6) friable to firm clay loam or sandy clay; common, fine, distinct, yellow (10YR 7/6), brownish-yellow (10YR 6/6), and light yellowish-brown (10YR 6/4) variegations; moderate fine and medium blocky structure; patchy dark-red (2.5YR 3/6) clay skins; a few small quartzite pebbles and a few to moderate number of fine pieces of chert gravel; strongly acid.

C 46 to 60 inches, red (2.5YR 4/6) firm clay loam or sandy clay; a moderate number of fine and medium, prominent, yellowish-red (5YR 4/6), reddish-yellow (7.5YR 6/6), yellow (10YR 7/8), and brownish-yellow (10YR 6/6) variegations and few, fine, prominent, pale-yellow (2.5Y 8/4), light brownish-gray (10YR 6/2), and gray (10YR 6/1) variegations; moderate medium blocky structure; a few to a moderate number of fine pieces of gravel and small quartzite pebbles; strongly or very strongly acid; underlain by moderately cherty limestone residuum.

Included with this soil are about 50 acres that have sloping relief.

Nolichucky loam, gently sloping phase, has slow to medium surface runoff and medium internal drainage. It is strongly acid to very strongly acid, medium in plant nutrients, and moderate in organic matter. Permeability is moderately rapid in the surface soil and moderate in the subsoil. The water-supplying capacity is moderate. This soil is very easy to work, and good tilth is easy to maintain. Under good management, the risk of erosion is slight to moderate.

Nolichucky loam, eroded gently sloping phase (Nc) (Capability unit IIe-3).—This soil differs from Nolichucky loam, gently sloping phase, in having a slightly shallower grayish-brown or yellowish-brown surface soil. Included are a few small severely eroded areas that have a surface soil of yellowish-brown to yellowish-red or reddish-yellow, friable, light clay loam or heavy loam.

Nolichucky clay loam, severely eroded sloping phase (Na) (Capability unit IIIe-3).—This soil differs from Nolichucky loam, gently sloping phase, in having a shallower, somewhat firmer, and finer textured surface soil. The surface soil varies from yellowish-brown to reddish-yellow in the areas that still retain a considerable part of the original surface soil to yellowish-red or red in the areas where tillage is entirely within the subsoil. A few gullies have formed. This soil has poor workability. The risk of further erosion is high.

Included is a total of about 60 acres that is moderately eroded and about 15 acres that has enough deep gullies to interfere with tillage. The moderately eroded soil has a grayish-brown or yellowish-brown very friable loam surface soil, 5 to 8 inches thick.

Pace series

The Pace series consists of moderately well drained to well drained soils derived from accumulations of old colluvium and local alluvium. These materials have washed or drifted from upland soils—chiefly Bodine, Baxter, and Mountview—that were underlain chiefly by cherty limestone. The Pace soils are widely distributed in small to medium areas on gently sloping to strongly sloping foot slopes, benches, and old alluvial-colluvial fans.

Pace soils have a surface soil of brown, dark-brown, or dark grayish-brown to yellowish-brown cherty silt loam. Their subsoil is yellowish-brown, light yellowish-brown, or brown cherty silt loam to cherty silty clay loam. The lower part of the subsoil is mottled or underlain by a discontinuous fragipan.

The surface soil ranges from dark brown to grayish brown. The depth of the colluvium ranges from 3 to 8 feet. A compacted fragipan layer usually occurs at depths of 32 to 48 inches in the smoother gently sloping areas, but a mottled or variegated B_3 horizon occurs in the more dissected and sloping areas. The amount of phosphorus varies from medium to low. Enough chert fragments are scattered on the surface to interfere with the use of farm machinery. These fragments generally range from ¼ to 4 inches in diameter.

The phosphatic Pace soils make up most of the acreage of Pace soils in Coffee County. They occur in the Armour-Huntington-Lindside and the Bodine-Dellrose soil associations. Small acreages of other Pace soils occur in other soil associations.

The Pace soils are associated with the Armour, Dellrose, Greendale, and Hermitage soils. They are more cherty, less brown, and less productive than the Armour soils. The Pace soils occupy less steep slopes than the Dellrose soils. Their strongly developed ABC profile differs from the AC profile of the Greendale soils. The Pace soils are lighter in color, coarser in texture, and less productive than the Hermitage soils, which contain little chert.

About 90 percent of the acreage of Pace soils is eroded, and almost all of the rest is severely eroded.

Pace cherty silt loam, eroded gently sloping phosphatic phase (Pa) (Capability unit IIe-2).—The following describes a profile of this soil in a cultivated area:

A_p 0 to 6 inches, brown (10YR 4/3) or dark-brown (10YR 3/3) friable cherty silt loam; weak to moderate fine granular structure; medium or strongly acid; range in thickness, 4 to 9 inches.

A_3 6 to 10 inches, brown (10YR 4/3) or yellowish-brown (10YR 5/4) friable cherty silt loam; weak very fine subangular blocky structure; strongly acid; range in thickness, 2 to 6 inches.

B_1 10 to 16 inches, yellowish-brown (10YR 5/4) or brown (10YR 4/3) friable, cherty, heavy silt loam or light silty clay loam; weak to moderate very fine subangular blocky structure; strongly acid; range in thickness, 4 to 10 inches.

B_2 16 to 34 inches, yellowish-brown (10YR 5/4) friable cherty silty clay loam; a moderate number of fine, faint, light yellowish-brown (10YR 6/4) or brownish-yellow (10YR 6/6) and pale-brown (10YR 6/3) variegations; moderate fine subangular blocky structure; some patchy clay skins and a few black concretions or specks; strongly acid; range in thickness, 10 to 20 inches.

B_3 or B_{3m} 34 to 47 inches, mottled or variegated yellowish-brown (10YR 5/6 or 5/4) pale-brown (10YR 6/3), light brownish-gray (10YR 6/2), and light-gray (10YR 7/2) friable (firm or compact in place) cherty silty clay loam; mottles or variegations many, fine to medium, and faint; moderate medium blocky or subangular blocky structure; some patchy clay skins; a moderate number to many black and reddish-brown concretions, segregations, and stains; strongly acid; range in thickness, 6 to 18 inches.

C 47 to 60 inches, mottled yellowish-brown (10YR 5/4) or reddish-yellow (7.5YR 6/6 or 5YR 6/6) and light-gray (10YR 7/1 and 7/2), light brownish-gray (10YR 6/2), reddish-brown (5YR 4/4), and yellowish-red (5YR 4/6) firm cherty or very cherty silty clay loam; mottles many, fine, and prominent; weak medium subangular blocky or blocky structure; a moderate number to many black concretions or segregations; strongly acid; underlain by residuum of phosphatic argillaceous limestone.

Included with this soil are areas totaling about 42 acres that are severely eroded. These inclusions have a yellowish-brown or brown friable cherty silty clay loam surface soil and few shallow gullies.

Pace cherty silt loam, eroded gently sloping phosphatic phase, has medium surface runoff and medium internal drainage. This soil is medium to strongly acid, low to medium in plant nutrients, low to moderate in organic matter, and moderate in water-supplying capacity. Although the soil is not low in phosphorus, the yields of some crops are increased by its use. Permeability is moderately rapid in the surface soil and moderately slow in the subsoil. Below depths of 32 to 36 inches, the movement of water and air and the growth of plant roots are somewhat restricted. The soil has good workability. The risk of erosion is slight to moderate.

Pace cherty silt loam, eroded sloping phosphatic phase (Pb) (Capability unit IIIe–2).—This soil has a discontinuous fragipan layer (B_{3m}) that occurs in fewer places than the fragipan layer of Pace cherty silt loam, eroded gently sloping phosphatic phase. It also has a wider range in depth and a slightly lower average depth than the gently sloping phase.

Areas are included that differ in degree of erosion and in slope. A small acreage, which remains in hardwoods, is uneroded or only slightly eroded. About 61 acres is severely eroded, and about 62 acres is strongly sloping. About 11 acres on the strong slopes have been severely eroded. The severely eroded inclusions have a surface soil of brown or yellowish-brown, friable, cherty silty clay loam and a moderate number of shallow gullies that interfere with tillage. A few gullies cannot be crossed by farm machinery.

Pace cherty silt loam, eroded gently sloping phase (Pc) (Capability unit IIe–2).—This soil differs from Pace cherty silt loam, eroded gently sloping phosphatic phase, in being somewhat lighter in color and low or very low in phosphorus content.

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

A_p 0 to 6 inches, grayish-brown (10YR 5/2), dark grayish-brown (10YR 4/2), or brown (10YR 4/3) friable cherty silt loam.

A_3 6 to 10 inches, brown (10YR 5/3 to 4/3) or yellowish-brown (10YR 5/4) friable cherty silt loam.

B_1 10 to 14 inches, yellowish-brown (10YR 5/4) or light yellowish-brown (10YR 6/4) friable cherty light silty clay loam.

B_2 14 to 27 inches, yellowish-brown (10YR 5/4 to 5/6) or light yellowish-brown (10YR 6/4) friable cherty silty clay loam.

B_3 or B_{3m} 27 to 38 inches, light yellowish-brown (10YR 6/4) firm, compact cherty silty clay loam; many, faint, fine, yellowish-brown (10YR 5/4), pale-brown (10YR 6/3), and light-gray (10YR 7/2) mottles.

C 38 to 50 inches, firm cherty or very cherty silty clay loam showing many, fine, distinct, yellowish-brown (10YR 5/6), brownish-yellow (10YR 6/6), pale-yellow (2.5Y 7/4), and light-gray (2.5Y 7/2) variegations or mottles and a few, fine, prominent, yellowish-red (5YR 5/6) and red (2.5YR 4/6) mottles; underlain by residuum of cherty limestone.

Included are few small areas that are uneroded or only slightly eroded and a small part that is severely eroded. Part of the uneroded inclusions remains in mixed hardwoods forest. The severely eroded inclusions have a surface soil of brown or yellowish-brown friable cherty silty clay loam.

Pace cherty silt loam, eroded sloping phase (Pd) (Capability unit IIIe–2).—This soil differs from Pace cherty silt loam, eroded gently sloping phase, in having a thinner and more weakly developed B_3 horizon that is less commonly replaced or underlain by fragipan. It also differs in having a wider range in depth and a lower average depth. This soil is easy to work, and the risk of erosion is moderate.

About 30 acres of this soil is in hardwoods forest. In these areas the soil has a dark grayish-brown friable cherty silt loam A_1 horizon that is 1 to 2 inches thick. Below this are the pale-brown to yellowish-brown, friable, cherty silt loam A_2 and A_3 horizons. The entire thickness of the A horizon ranges from 12 to 16 inches.

Pembroke series

The Pembroke series consists of very deep, friable, well-drained soils on the uplands. These soils have developed from a thin mantle of loesslike material that overlies residuum of high-grade limestone. They occur almost entirely on low gently sloping ridge crests.

Pembroke soils have a dark-brown to dark reddish-brown friable silt loam surface soil. Their subsoil is yellowish-red, reddish-brown, or dark reddish-brown to dark-red friable to firm silty clay loam.

In most places the color of the surface soil is dark brown. In some places the combined thickness of the friable A, B_1 and B_2 horizons does not exceed 16 inches, and generally there is no B_3 horizon. In other places the combined thickness of the A, B_1, B_2, and B_3 horizons ranges from 30 to 52 inches.

The Pembroke series has only one soil in Coffee County. It is not extensive but it is important to farming. Most of the acreage is in the Mountview-Cookeville-Pembroke and the Cookeville-Cumberland-Hermitage soil associations. Small widely separated areas are in the Dickson-Mountview-Lobelville association and the Mountview-Baxter-Lobelville association.

Pembroke soils are associated with the Decatur and Cookeville soils. They occupy less steep and less exposed slopes than the Decatur and Cookeville soils.

Pembroke silt loam, eroded gently sloping phase (Pe) (Capability unit IIe–1).—The following describes a profile of this soil in a cultivated area:

A_p 0 to 7 inches, dark-brown (10YR 3/3 or 7.5YR 3/2) or brown (10YR 4/3) friable silt loam; moderate fine to medium granular structure; range in thickness, 5 to 9 inches.

A_3 7 to 11 inches, brown (7.5YR 4/4) friable silt loam; moderate medium granular structure; a few black ferromanganese concretions 1.0 millimeter in diameter; range in thickness, 2 to 7 inches.

B_1 11 to 17 inches, yellowish-red (5YR 4/6), reddish-brown (5YR 4/4), or dark reddish-brown (5YR 3/4) friable silty clay loam; weak to moderate fine subangular blocky or blocky structure; some patchy clay skins; a few black concretions 1.0 to 2.0 millimeters in diameter; range in thickness, 4 to 9 inches.

B_2 17 to 26 inches, yellowish-red (5YR 4/6) or dark reddish-brown (5YR 3/4) to dark-red (2.5YR 3/6) friable silty clay loam; moderate medium subangular blocky to blocky structure; continuous clay skins; a few pale-brown (10YR 6/3) light silty clay loam pockets and variegations; a moderate number of black concretions and segregations 1.0 to 2.0 millimeters in diameter; range in thickness, 8 to 18 inches.

B_3 26 to 32 inches, yellowish-red (5YR 4/6), dark reddish-brown (5YR 3/3), or dark-red (2.5YR 3/6) friable to firm silty clay loam; many, medium, prominent, pale-brown (10YR 6/3), light yellowish-brown (10YR 6/4), and strong-brown (7.5YR 5/6) variegations; continuous clay skins that have a blackish cast apparently because the coatings contain an appreciable amount of ferromanganese; distinct irregular lower boundary with a few tongues extending to a depth of 50 inches; range in thickness, 3 to 20 inches.

B_{1b} 32 to 40 inches, dark-red (2.5YR 3/6) to dark reddish-brown (2.5YR 3/4) friable to firm heavy silty clay loam; a moderate number of fine or medium, distinct or prominent, pale-brown (10YR 6/3), light yellowish-brown (10YR 6/4), and reddish-brown (5YR 5/4 to 4/4) variegations; moderate to strong fine and medium blocky structure; continuous clay skins; a few black concretions 1.0 to 2.0 millimeters in diameter; horizon boundary broken by tongues extending from horizon above; range in thickness 5 to 17 inches.

B_{2b} 40 to 66 inches, dark-red (2.5YR 3/6) or dark reddish-brown (2.5YR 3/4) firm silty clay; common, fine, prominent, reddish-yellow (5YR 6/8), pale-brown (10YR 6/3), or light yellowish-brown (10YR 6/4) variegations; strong medium blocky structure; continuous clay skins; a few black concretions and segregations 1.0 millimeter in diameter and a few finely divided fragments of chert; range in thickness, 14 to 35 inches.

B_{3b} 66 to 78 inches, dark-red (2.5YR 3/6) to dark reddish-brown (2.5YR 3/4) very firm clay; a few to a moderate number of fine, prominent, reddish-yellow (7.5YR 6/6) variegations and a few pockets of gray (10YR 6/1) and pale-brown (10YR 6/3) clay and partly weathered rock; moderate medium blocky structure; continuous clay skins; a moderate number of small angular chert fragments and a few dark reddish-brown and black concretions 1.0 millimeter in diameter; range in thickness, 6 to 15 inches.

C_b 78 to 96 inches, dark-red (2.5YR 3/6) very firm clay with a moderate number of fine to medium, prominent, reddish-yellow (5YR 6/8), light brownish-gray (10YR 6/2), yellow (10YR 7/6), and light yellowish-brown (10YR 6/4) variegations; weak coarse blocky structure; a moderate number of angular chert fragments ½ to 3 inches in diameter.

Included with this soil are about 20 acres that are severely eroded. This acreage has a surface soil of reddish-brown or dark-reddish brown friable silty clay loam. In about 140 acres of hardwoods forest, the A horizon is somewhat thicker than it is in cultivated areas.

Pembroke silt loam, eroded gently sloping phase, has medium surface runoff and medium internal drainage. This soil is medium to strongly acid, moderate in organic matter, and medium to high in plant nutrients. It is moderately permeable throughout the profile. The water-supplying capacity is moderate to high. This soil has very good workability, and good tilth is easy to maintain. The erosion risk is slight to moderate.

Prader series

The Prader series consists of poorly drained gray soils of the bottom lands. These soils have formed from recent alluvium washed chiefly from soils derived from sandstone residuum and an admixture of materials from soils derived from limestone residuum. These soils occur on level flood plains.

The Prader soils in this county generally have a very friable fine sandy loam surface soil containing a few to many, faint, fine, brown, brownish-yellow, and light-gray mottles. The underlying layer is a friable fine sandy loam, sandy clay loam, or loam containing many fine yellowish-brown, brownish-yellow, light olive-brown, and yellow mottles.

The texture of the underlying layer ranges mostly from fine sandy loam to fine sandy clay loam, but in places the more clayey materials predominate. Water is at or near the surface most of the time, and some areas are swampy. In a few places the surface soil may be somewhat browner than typical because of recent deposition, slightly better surface drainage, or cultivation.

The Prader series has only one soil mapped in Coffee County. It is widely distributed in small areas and is of little agricultural importance. It occurs in the Dickson-Mountview-Lobelville, the Holston-Monongahela-Tyler, and the Waynesboro-Cumberland-Hamblen soil associations.

The Prader soils are associated with the Staser, Hamblen, Tyler, and Purdy soils. They typically occur on the outer rim of the flood plain, next to the Staser and Hamblen soils, which are nearer the streams. They are also associated with the Tyler and Purdy soils on the stream terraces. The Prader soils occupy similar positions and have the same degree of drainage as the Lee soils, which were derived from recent alluvium originating from limestone.

Prader fine sandy loam (Pf) (Capability unit IIIw-2).—The following describes a profile of this soil:

A_1 0 to 8 inches, gray (10YR 6/1) or light brownish-gray (2.5Y 6/2) very friable fine sandy loam containing a few to many, fine, faint, brown (10YR 5/3), brownish-yellow (10YR 6/6), and light-gray (10YR 7/1) mottles; weak fine granular structure; slightly or medium acid.

C_{g1} 8 to 18 inches, gray (10YR 6/1) or light-gray (10YR 7/1) friable fine sandy loam, sandy clay loam, or loam; many, fine, faint, yellowish-brown (10YR 5/6), brownish-yellow (10YR 6/6), and yellow (2.5Y 7/6) mottles; weak to moderate fine granular structure; medium acid.

C_{g2} 18 to 42 inches +, light-gray (10YR 7/1) to gray (10YR 5/1) friable fine sandy loam, fine sandy clay loam, or loam; many, fine, distinct yellowish-brown (10YR 5/6), or brownish-yellow (10YR 6/6), light olive-brown (2.5Y 5/4), and yellow (2.5Y 7/6) mottles; strongly acid or medium acid; grades to stratified layers of widely variable soil material having a large percentage of sand and clay.

The principal inclusions are areas of Prader loam, which is not mapped separately in this county. Also included is a small acreage of soil that was formed in local alluvium along small drainageways, in slight upland depressions, and at the foot of slopes.

The surface runoff of Prader fine sandy loam is very slow to ponded, and internal drainage is very slow. A high water table is at or near the surface much of the time and greatly restricts the growth of plant roots. The soil is slightly to strongly acid, moderate in organic matter, and medium in plant nutrients. It has good workability when moisture conditions are favorable. Many areas are continually receiving sediments from overflow. Drainage by open ditches, bedding, or tiling would broaden use suitability.

About 40 percent of this soil remains in mixed water-tolerant hardwoods, mainly oak, hickory, gum, sycamore, maple, ash, willow, and alder. The cleared land is used chiefly for pasture, but a small part is used for corn, soybeans, and lespedeza.

Purdy series

The Purdy series consists of poorly drained gray soils of the terraces. They have developed in old alluvium in flats or depressions. This alluvium was derived chiefly from acid sandstone residuum and contains an admixture of materials derived from limestone.

The surface soil of Purdy soils ranges from dark gray to light gray and from silt loam to fine sandy loam. Their subsoil is distinctly mottled and friable to firm. It is underlain by a compacted slowly pervious layer.

In depressed or ponded areas the deeper part of the profile is predominantly a gray, firm silty clay or clay that is sticky and plastic when wet. In other places it is predominantly mottled gray and yellow friable clay loam, silty clay loam, or sandy clay loam. The compacted layer (B_{3m}) ranges from a fragipan in some profiles to a claypan in others. It is variable in both thickness and development and is not continuous in all profiles. In many places a thin overwash layer occurs. This layer is darker than the A_1 and A_2 horizons.

The Purdy soils occur principally in the Holston-Monongahela-Tyler and the Waynesboro-Cumberland-Hamblen soil associations. Small acreages occur in the Dickson-Mountview-Lobelville association. Purdy soils are not extensive and not very important agriculturally.

Purdy soils are associated with the Holston, Monongahela, and Tyler soils of the terraces and the Prader and Hamblen soils of the bottom lands. They are more poorly drained throughout the profile than the Tyler soils. Their horizons are more well defined than those of the Prader soils, which were derived from recent alluvium. The Purdy soils are similar to the Robertsville and Guthrie soils, but they are coarser textured throughout and have different parent material.

About 65 percent of the areas of Purdy soils remains in mixed hardwoods forest consisting chiefly of the water-tolerant oak, hickory, beech, sycamore, ash, alder, sweetgum, and maple. Most of the cleared areas are used for pasture.

Purdy loam (Pg) (Capability unit IVw–1).—The following describes a profile of this soil:

A_{00} and A_0 1 to 0 inch, forest litter and leaf mold.

A_1 0 to 2 inches, gray (10YR 5/1) very friable loam showing few, fine, faint mottles of light gray or light brownish gray (10YR 7/2 or 6/2); weak fine granular structure; very strongly acid.

A_2 2 to 10 inches, light-gray (10YR 6/1 to 7/2) or light brownish-gray (2.5Y 6/2) very friable loam; moderate number of fine, distinct, brownish-yellow (10YR 6/6) or light olive-brown mottles; weak fine to medium granular or very fine subangular blocky structure; very strongly acid.

B_{g1} 10 to 18 inches, mottled light-gray (10YR 6/1 to 7/1) and brownish-yellow to yellow (10YR 6/6 to 7/6), or light olive-brown (2.5Y 5/4 to 5/6) friable loam, silt loam, light silty clay loam, or light clay loam; mottles many, fine, and distinct; strongly or very strongly acid.

B_{2g} 18 to 24 inches, mottled light-gray (10YR 6/1 to 7/1) and brownish-yellow (10YR 6/6) or light olive-brown (2.5Y 5/4 to 5/6) friable clay loam or silty clay loam; mottles many, medium, and distinct; weak to moderate fine and medium blocky and subangular blocky structure; strongly or very strongly acid.

B_{3m} 24 to 46 inches, mottled light-gray (10YR 7/1 to 2.5Y 7/2), brownish-yellow (10YR 6/6), and light yellowish-brown or light olive-brown (2.5Y 6/4 to 5/4) firm, compact clay loam, silty clay loam, or light silty clay loam; mottles many, medium, and distinct; a few, fine, distinct, strong-brown (7.5YR 5/8) and olive-brown (2.5Y 4/4) mottles; weak medium blocky structure to structureless (massive); strongly or very strongly acid.

C 46 to 60 inches +, mottled light-gray (10YR 7/1), gray (10YR 6/1), brownish-yellow (10YR 6/6), yellow (10YR 7/6), and strong-brown (7.5YR 5/8) stratified layers or beds of silty clay, sandy clay, and clay intermixed with small quartzite pebbles, fine gravel, and sand; mottles many, medium to coarse, and prominent; a few, fine, prominent, yellowish-red (5YR 5/6) mottles in the lower part; very strongly acid.

Included with this soil are small areas of Tyler, Prader, and Robertsville soils, and Purdy loam, overwash phase.

Purdy loam has very slow to ponded surface runoff and very slow internal drainage. The compacted layer (B_{3m}) retards or almost stops water movement. A fluctuating water table is at or near the surface a considerable part of the time. Permeability is moderate in the surface soil and very slow in the subsoil. The soil is very strongly acid to strongly acid. Cultivated areas are low in plant nutrients and organic matter. Artificial drainage is not economically feasible in many areas because there are no suitable outlets. The workability of the soil is fair. There is no risk of erosion.

Purdy loam, overwash phase (Ph) (Capability unit IIIw–1).—This soil generally occurs in small shallow depressions in narrow areas at the base of steep slopes. It differs from Purdy loam chiefly in having a thicker, darker, and somewhat better drained surface soil, and in being more productive. A layer of material, 5 to 12 inches thick, has been deposited recently over most of this soil. This material washed from higher slopes that were occupied chiefly by Holston, Monongahela, Waynesboro, and Nolichucky soils.

The color and texture of the surface soil depend mainly on the source of overwash, length of time the overwash has been in place, and local drainage. The surface soil may be brown, grayish brown, dark grayish brown or gray. Some included areas have a surface soil of silt loam or fine sandy loam.

Robertsville series

The Robertsville series consists of poorly drained gray soils of the terraces. They occur on level, low stream terraces, and in depressions of high stream terraces. They have developed under a water-tolerant hardwoods forest from sediments that washed from upland soils. These sediments were derived mainly from limestone materials, but some were derived from sandstone materials.

The Robertsville soils have a light brownish-gray or a brown to grayish-brown friable silt loam surface soil. Their subsoil is a mottled friable to firm silty clay loam to a firm or compacted silty clay.

In many small areas a thin layer of soil material has washed from adjacent slopes and covered the surface. In these areas of the Robertsville soils the surface soil is somewhat darker colored and thicker than typical. The compacted layer (B_{3m}) ranges in development from weak to moderate. It ranges in consistence and in texture from firm heavy silty clay loam or clay to firm sandy clay where the parent material contained an admixture of sand. In forested areas the upper 1- to 2-inch layer is gray (10YR 5/1) or dark-gray (10YR 4/1) friable silt loam.

The Robertsville soils are widely distributed throughout the Highland Rim and Red Belt sections of the county, but their total acreage is small. The principal areas are in depressions in the Waynesboro-Cumberland-Hamblen soil association and on low stream terraces in the Dickson-Mountview-Lobelville association.

The Robertsville soils are associated mainly with the Captina and Taft soils of the terraces and the Lobelville and Lee soils of the bottom land. They generally occur on slightly higher and more nearly level positions than the Captina soils, and they are browner and more poorly drained. They are more poorly drained than the Taft soils and are mottled at shallower depths. Robertsville soils differ in parent material from the Lobelville and Lee soils, which were derived from young alluvium. They are similar to the Guthrie soils, in color, drainage and relief, but they differ in parent material.

About 60 percent of the acreage of Robertsville soils has been cleared and is used mainly for summer pasture. A small part is used for corn, soybeans, and lespedeza. The rest is in mixed hardwoods forest consisting of water-tolerant oak, hickory, gum, sycamore, maple, ash, alder, and beech. There are scatterings of swampgrasses.

Robertsville silt loam (Ra) (Capability unit IVw–1).—The following describes a profile of this soil in a cultivated area:

A_p 0 to 6 inches, light brownish-gray (2.5Y 6/2 or 10YR 6/2) friable silt loam; weak to moderate fine granular structure; strongly or very strongly acid.

A_2 6 to 12 inches, light brownish-gray (2.5Y 6/2) friable silt loam; few, fine, faint light-gray (10YR 7/1) and light yellowish-brown (2.5Y 6/4) mottles; weak very fine or fine subangular blocky structure; strongly or very strongly acid.

B_{2g} 12 to 18 inches, mottled light-gray (10YR 7/1), brownish-yellow (10YR 6/6), pale-yellow (2.5Y 7/4), and strong-brown (7.5YR 5/6) friable to firm silty clay loam; mottles many, fine, and distinct; moderate fine or medium subangular blocky structure; patchy clay skins; very few gray seams or small pockets of silty clay; few black and brownish concretions or specks; very few fine pieces of chert gravel or quartzite pebbles, or both; very strongly acid; irregular gradual lower boundary.

B_{3m} 18 to 48 inches, mottled light-gray (10YR 7/1), white (10YR 8/1), yellowish-brown (10YR 5/6), and strong-brown (7.5YR 5/6) firm or compacted (plastic when wet and very hard when dry) silty clay; many, fine to medium, distinct mottles; structureless (massive); a few pieces of chert gravel and quartzite pebbles; patchy clay skins; a few to a moderate number of black and brownish concretions or segregations; very few to few tongues descending from above horizon; very strongly acid.

C 48 to 60 inches +, mottled gray, light-gray, yellowish-brown, yellow, and strong-brown firm silty clay, clay, or sandy clay; mottles many, medium, and prominent; weak medium blocky structure to structureless (massive); very strongly acid.

The main inclusions of this mapping unit are small areas of Robertsville silt loam, overwash phase, and Lee, Taft, and Purdy soils.

Robertsville silt loam has very slow to ponded surface runoff and very slow internal drainage. Many areas in depressions remain ponded for long periods. In areas not likely to be ponded, the high water table saturates the lower part of the soil much of the time. This soil is droughty during extended dry periods, usually late in summer. It is strongly to very strongly acid and low in plant nutrients and organic matter. The surface soil is moderately permeable. The subsoil is very slowly permeable, and there is little or no penetration of roots. Because of the lack of suitable outlets and the clayey subsoil, the soil is difficult to drain artificially. The workability is poor.

Robertsville silt loam, overwash phase (Rb) (Capability unit IIIw–1).—This soil differs from Robertsville silt loam in having a thicker, darker colored, and somewhat better drained surface soil. A recent overwash from adjacent slopes has deposited 5 to 12 inches of soil material on the surface. This overwash layer is highly variable in color and ranges from brown to gray or dark gray. Its color depends mainly on the source of the material, the length of time it has been in place, and local drainage. Most of the overwash material is from Cumberland, Waynesboro, Baxter, Cookeville, and Mountview soils. This soil generally occupies small areas along the boundary of larger areas of Robertsville silt loam and positions in small depressions. It is somewhat better suited to crops than Robertsville silt loam because of its deeper and better drained surface soil. It has good workability.

Rockland

Rockland, moderately steep (Rd) (Capability unit VIIs–1).—This land consists mainly of limestone outcrops, large limestone boulders, and very shallow soils. It occurs on slopes ranging from 12 to 75 percent or more, and includes many perpendicular walls or escarpments and rock outcrops that cover 25 percent or more of the surface.

The soil material of this land is chiefly residue from weathered limestone; some areas contain small quantities of material from shale. The soil material in the interstices is chiefly very firm silty clay or clay that ranges from yellow or olive yellow to red. The depth of the soil material ranges from a few inches to several feet, according to the depth of the crevices and holes in or between the rocks. Surface runoff is very rapid, and internal drainage is slow.

Included are a few areas of the complex Mimosa, Baxter, and Colbert very rocky soils and Rockland, sloping.

Rockland, moderately steep, occurs in the Bodine-Dellrose and in the Rockland-Bouldery colluvial land soil associations. In the Bodine-Dellrose association, most of the soil material and limestone rock is phosphatic. In places the soil material is strong brown to depths of 3 feet or more and resembles Mimosa soils. In the Rockland-Bouldery colluvial land association, most of the soil material is yellow or olive mottled with brown, gray, and red. It resembles the Colbert soils. In places, however, the soil materials is red or yellowish-red to depths of 2 to 3 feet or more, and it resembles the Talbott soils.

In the Bodine-Dellrose association, Rockland, moderately steep, occupies the steep ridges, where it occurs with the Mimosa and Dellrose soils; phases of the Mimosa, Baxter, and Colbert very rocky soils; and Rockland, sloping. In the Rockland-Bouldery colluvial land association, it occurs in wide continuous belts covering most of the lower rocky slopes that lie between the Cumberland Plateau and the limestone valleys. In this area it is associated with phases of Mimosa, Baxter, and Colbert very rocky soils; Bouldery colluvial land, strongly sloping; and Rockland, sloping.

Nearly all of Rockland, moderately steep, is in forest. Some is in woodland pasture. A small acreage is cleared. The forest consists of stands of cedar or mixed hardwoods and scattered cedars. Some hardwood and cedar is marketed for lumber; locust and cedar are used for fence posts. Several rock-crushing plants use the limestone rock for making road gravel, agricultural lime, and other commercial products.

Rockland, sloping (Rc) (Capability unit VIIs-1).—This land differs from Rockland, moderately steep, in occurring on slopes that range mostly from 5 to 12 percent. Because of the irregular relief and the difficulty of mapping, some areas are included that have slopes of less than 5 percent or more than 12 percent. Rockland, sloping, occurs mostly on ridges and benchlike slopes below Rockland, moderately steep.

More of this land than Rockland, moderately steep, has been cleared and used for pasture, chiefly because it is more accessible and its surface soil generally is somewhat deeper.

Rock outcrop

Rock outcrop (Re) (Capability unit VIIs-1).—This miscellaneous land type consists almost entirely of massive sandstone. It forms the narrow, almost vertical, part of the Cumberland Escarpment that is between the Cumberland Plateau and the lower limestone hills of the escarpment. Most Rock outcrop has no vegetation, but the few places that contain small amounts of Muskingum soil material grow a sparse vegetation of shrubs and a few scrubby trees. Rock outcrop is inextensive and has no present agricultural use. All of it is in the Rockland-Bouldery colluvial land association.

Sango series

The Sango series consists of moderately well drained upland soils that have a fragipan. They occur on level to gently sloping plains and divides and in slight depressions. These soils have developed under a deciduous forest from a thin mantle of loesslike material that overlies cherty limestone residuum. They are practically uneroded or only slightly eroded.

Sango soils have a surface soil of light brownish-gray or grayish-brown to light yellowish-brown or pale-brown very friable silt loam. Their subsoil is a light yellowish-brown friable silt loam in the upper part and a distinctly mottled firm or compact silt loam fragipan in the lower part.

The depth to the fragipan (B_{3m}) ranges from 18 to 36 inches, but generally it is between 22 and 25 inches. In a few places, the fragipan is deeper than 42 inches, or it does not occur. It ranges in thickness from about 6 to 30 inches. It is weakly to strongly developed. The B_1 and B_2 horizons range from pale yellow to light olive brown and from a silt loam to a light silty clay loam. In the smaller areas occupying divides, slight depressions, and benches, the soil underlying the fragipan is predominantly mottled gray and yellowish-brown friable silt loam that contains little chert. This material grades to predominantly mottled red, gray, and yellowish-brown, cherty, firm silty clay loam or clay on the upland plains and ridgetops. The cultivated areas of Sango silt loam have a grayish-brown surface soil to depths of 6 to 8 inches.

The Sango series has only one soil mapped in Coffee County. It is widely distributed throughout the Dickson-Mountview-Lobelville soil association. The principal areas are in the section of the county near Maple Springs, Summitville, and Womack Lake. This soil is moderate in extent and in agricultural importance.

The Sango soils are associated with the Dickson, Lawrence, and Guthrie soils. They generally are lighter colored in the surface soil and upper subsoil than the Dickson soils. They are better drained than the Lawrence and Guthrie soils.

Sango silt loam (Sa) (Capability unit IIe-4).—The following describes a profile of this soil in a forested area:

A_{00} and A_0 1 to 0 inch, forest litter and leaf mold; range in thickness, 0 to 1 inch.

A_1 0 to 1 inch, light brownish-gray (10YR 6/2), grayish-brown (10YR 5/2), or pale-brown (10YR 6/3) very friable silt loam stained with gray (10YR 5/1) or dark grayish-brown (10YR 4/2) organic matter; weak fine crumb or granular structure; strongly or very strongly acid; range in thickness, 1 to 3 inches.

A_2 1 to 8 inches, pale-brown (10YR 6/3) to light yellowish-brown (2.5Y 6/4) very friable silt loam; weak fine granular structure to weak fine subangular blocky structure; very few small brownish concretions; strongly or very strongly acid; range in thickness, 5 to 11 inches.

A_3 8 to 11 inches, light yellowish-brown (2.5Y 6/4) to pale-brown (10YR 6/3) very friable silt loam; a few to a moderate number of fine, faint, gray (10YR 6/1), light yellowish-brown (10YR 6/4), and very pale brown (10YR 7/3) mottles or coatings; weak fine subangular blocky structure; very few small brownish or black concretions; strongly or very strongly acid; range in thickness, 2 to 5 inches.

B_1 11 to 16 inches, light yellowish-brown (2.5Y 6/4) friable silt loam; weak fine subangular blocky structure; very few small concretions and chert fragments; strongly or very strongly acid; range in thickness, 4 to 8 inches.

B_2 16 to 24 inches, light yellowish-brown (2.5Y 6/4) friable silt loam with a few to a moderate number of fine, faint, gray (10YR 6/1) and yellowish-brown (10YR 5/4) mottles; weak fine to medium subangular blocky or blocky structure; an occasional gray clay skin or coating; a few fine chert fragments and brownish and black concretions or concretionary specks or splotches; strongly or very strongly acid; boundary normally abrupt wavy to irregular.

B_{3m} 24 to 42 inches, mottled gray (10YR 6/1), light grayish-brown (2.5Y 6/2), light yellowish-brown (2.5Y 6/4), and yellowish-brown (10YR 5/6) silt loam that is firm or compact in place but brittle and friable when crushed; mottles many, medium, and distinct; weak medium or coarse blocky structure; a few gray silty clay loam or silty clay seams and coatings; a moderate number of brownish and black concretions 1.0 millimeter in diameter and angular chert fragments 1 to 2 inches in diameter; strongly or very strongly acid; abrupt wavy to irregular boundary.

B_b 42 to 60 inches +, mottled gray (2.5Y 5/0), light brownish-gray (10YR 6/2), light yellowish-brown (10YR 6/4), yellowish-brown (10YR 5/6), and red (2.5YR 4/6) or strong-brown (7.5YR 5/6) firm, heavy silt loam or silty clay loam; mottles many, medium to coarse, and prominent; a few, fine, distinct dark-gray (2.5Y 4/0) and pale-olive (5Y 6/3) mottles; poorly defined blocky structure; a few gray silty clay seams or pockets; a few to many chert fragments ½ to 3 inches in diameter.

Included with this soil is about 10 acres of Sango soil that is eroded and about 160 acres that is on slopes of 2½ to 3 percent. Also included are small areas of Dickson and Lawrence soils that are too small to delineate on the map.

Sango silt loam has slow surface runoff and slow to medium internal drainage. The drainage, however, is sufficient for most cultivated crops. Permeability is moderate in the surface soil and moderately slow in the subsoil. The soil remains wet or very moist early in the spring and does not warm well for early plantings. In periods of little rainfall the soil is droughty. It is strongly to very strongly acid and low in plant nutrients and organic matter. The soil has good workability and is easy to maintain in good tilth. The risk of erosion is slight.

About 60 percent of this soil is in cut-over and burned-over forest of inferior quality that consists chiefly of red, white, post, and blackjack oaks and a few sweetgum and blackgum.

Sequatchie series

The Sequatchie series consists of well-drained, mostly moderately coarse textured soils on low stream terraces. These soils have developed in old alluvium that was derived chiefly from sandstone and some limestone.

The Sequatchie soils generally have a very friable fine sandy loam surface layer. The subsoil is friable to very friable fine sandy clay loam or friable clay loam. The underlying layer is a friable clay loam, fine sandy loam, or fine sandy clay.

The B_2 and B_3 horizons range from a brown or yellowish-brown sandy clay loam on the more nearly level low stream terraces to a reddish-brown, strong-brown, or yellowish-red light clay loam on the more exposed and higher lying slopes. The C horizon ranges from mottled yellowish brown or brownish yellow and gray to predominantly reddish brown or yellowish red with few mottles. In a few undisturbed areas, the A_1 horizon is dark grayish brown or dark brown to depths of 1 to 2 inches and the A_2 horizon is brown to depths of 10 to 12 inches.

Sequatchie soils occur mainly in the Waynesboro-Cumberland-Hamblen soil association and less extensively in the Dickson-Mountview-Lobelville and the Holston-Monongahela-Tyler associations. Most of them are agriculturally important because they are suited to a wide variety of crops.

The Sequatchie soils are most commonly associated with the Whitwell soils of the low stream terraces; the Staser, Hamblen, and Prader soils of the first bottoms; and the Holston, Waynesboro, Nolichucky, Cumberland, and Etowah soils of the fairly high and high stream terraces. The Sequatchie soils are better drained than the Whitwell soils, which have yellower subsoil that is distinctly mottled below depths of 18 to 28 inches. They are browner and more productive than the Holston soils. Apparently they are younger than the Holston soils because their horizons are less well defined.

Practically all areas of the Sequatchie soils have been cleared of their original mixed hardwoods forest and are being used for a wide variety of crops. About 60 percent of the total area is uneroded or only slightly eroded, 38 percent is moderately eroded, and 2 percent is severely eroded.

Sequatchie fine sandy loam, gently sloping phase (Sd) (Capability unit IIe–1).—The following describes a profile of this soil in a cultivated area:

A_p 0 to 10 inches, brown (10YR 5/3 or 4/3) or dark-brown (10YR 3/3) very friable fine sandy loam; weak fine granular structure; slightly acid to medium acid; range in thickness, 8 to 12 inches.

B_1 10 to 16 inches, brown (10YR 4/3) or yellowish-brown (10YR 5/4) friable or very friable fine sandy clay loam or light clay loam; weak to moderate very fine or fine subangular blocky structure; medium acid.

B_2 16 to 28 inches, yellowish-brown (10YR 5/4), brown (10YR 4/3), or reddish-brown (5YR 4/4) friable clay loam or fine sandy clay loam; weak to moderate fine and medium subangular blocky structure; a few fine pieces of chert gravel or small quartzite pebbles; medium to strongly acid.

B_3 28 to 38 inches, yellowish-brown (10YR 5/6) friable clay loam or fine sandy clay loam; a few, fine, faint and distinct, light brownish-gray (10YR 6/2) mottles or splotches; weak to moderate fine and medium subangular blocky structure; a few small quartzite pebbles and fine pieces of chert gravel; medium to strongly acid.

C 38 to 48 inches +, yellowish-brown (10YR 5/6), brownish-yellow (10YR 6/6), or strong-brown (7.5YR 5/6) friable clay loam, fine sandy loam, or fine sandy clay; a moderate number of fine, distinct, gray (10YR 6/1) and light yellowish-brown (2.5Y 6/4) mottles and a few, fine, distinct, brown (7.5YR 4/4), reddish-brown (5YR 4/4), or yellowish-red (5YR 5/6) mottles; weak fine to medium subangular blocky structure; a variable quantity of fine pieces of chert gravel and small quartzite pebbles; strongly acid.

Surface runoff of this soil is slow, and internal drainage is medium. Permeability is rapid in the surface soil and moderate in the subsoil. The soil is slightly acid to strongly acid. It is moderate in organic matter and medium in plant nutrients. It has moderate water-supplying capacity. The soil has excellent workability and is very easy to maintain in good tilth. The erosion risk is slight.

Sequatchie fine sandy loam, eroded gently sloping phase (Se) (Capability unit IIe–1).—This soil has a surface soil that is 6 to 8 inches thick in most places—thinner than the surface soil of Sequatchie fine sandy loam, gently sloping phase. In places remnants of the original surface soil has been mixed with the upper subsoil to form the present surface soil. Included is a small acreage that is severely eroded. The surface soil of this inclusion is brown or yellowish-brown friable fine sandy clay loam.

Sequatchie fine sandy loam, level phase (Sc) (Capability unit I–1).—This soil differs from Sequatchie fine sandy loam, gently sloping phase, mainly in having a slightly thicker surface soil and slower surface runoff. Many areas are likely to be flooded for brief periods in winter and early in spring because this soil commonly occurs only 1 to 2 feet higher than the associated Staser and Hamblen soils of the first bottoms.

Sequatchie cobbly fine sandy loam, gently sloping phase (Sb) (Capability unit IVs–1).—This soil differs from Sequatchie fine sandy loam, gently sloping phase, in containing enough sandstone cobbles to make the soil practically worthless for hay and intertilled crops. The cobbles are rounded to subrounded. They range mostly from 3 to 10 inches in diameter, but a few are as much as 15 inches in diameter. The slopes range from 2 to 5 percent, but most of the soil has slopes of 2 to 3 percent.

All of this soil occurs in Lusk Cove in the Waynesboro-Cumberland-Hermitage soil association. Most of it is used for unimproved pasture, but some is reverting to forest. In one small area the larger cobbles have been removed from the surface, and the soil is used for crops. Pasture yields on this soil are considerably lower than on Sequatchie fine sandy loam, gently sloping phase.

Sequatchie sandy clay loam, severely eroded sloping phase (Sf) (Capability unit IIIe–1).—This soil has a shallower and somewhat firmer surface soil and wider range in depth than Sequatchie fine sandy loam, gently sloping phase. Depending on the degree of erosion, the surface soil of this mapping unit ranges from brown or yellowish brown to reddish brown and from sandy clay loam or clay loam to fine sandy loam. A moderate number of small pieces of chert gravel and small quartzite pebbles occur on the surface and in the surface soil and subsoil. This soil occurs in small or very small areas on short, sharp slopes in association with other Sequatchie soils. It is less well suited to crops than Sequatchie fine sandy loam, gently sloping phase, because of its stronger slopes, more rapid surface runoff, shallower depth, and generally low water-supplying capacity and plant-nutrient supply. Workability of the soil is poor and the risk of erosion high.

Included with this soil are about 25 acres of uneroded soil. This inclusion has a brown fine sandy loam surface soil about 6 inches thick. It is better suited to crops than Sequatchie sandy clay loam, severely eroded sloping phase. Also included are areas that have a clay loam surface soil.

Staser series

The Staser series consists of well-drained, coarse textured soils of the bottom lands. They have formed from sediment washed chiefly from upland soils underlain by sandstone. The sediment contains some material washed from soils underlain by limestone. These soils occur on level to gently sloping flood plains; nearly all areas are subject to overflow.

The Staser soils have a surface soil of dark-brown or brown very friable fine sandy loam. No B horizon has developed.

The C_1 horizon ranges from dark brown to yellowish brown and from loam to loamy fine sand. The C_2 horizon ranges from brown to yellowish brown and from loam to loamy fine sand or sandy clay loam. In places the C horizon contains a moderate number of mottles; in other places no mottles occur. The C_3 horizon varies greatly from place to place. In some places it does not occur. It is commonly replaced by almost any combination of sandy, silty, clayey, and gravelly stratified layers.

The Staser soils are not extensive, but they are important to farming. The principal areas are along Bradley, Bean, and Betsy Willis Creeks and the Elk River in the Waynesboro-Cumberland-Hamblen soil association. Small acreages are in the Dickson-Mountview-Lobelville and the Holston-Monongahela-Tyler associations.

Staser soils are associated with the Hamblen and Prader soils of the bottom lands and the Sequatchie and Whitwell soils of the low stream terraces. They are better drained than the Hamblen and Prader soils. The Staser soils are similar to the Huntington soils in position and drainage but differ mostly in being lighter colored, coarser textured, and less productive.

Staser fine sandy loam (Sg) (Capability unit I–1).—The following describes a profile of this soil:

A_1 0 to 12 inches, dark-brown (10YR 3/3) or brown (10YR 4/3) very friable fine sandy loam; weak fine crumb or granular structure; slightly acid or neutral.

C_2 12 to 26 inches, brown (10YR 4/3 or 7.5YR 4/4) or yellowish-brown (10YR 5/4) very friable fine sandy loam or loam; weak fine granular structure; slightly acid or neutral.

C_2 26 to 36 inches, brown (10YR 4/3) or yellowish-brown (10YR 5/4) very friable fine sandy loam or loamy fine sand; a moderate number of fine, faint, dark grayish-brown (10YR 4/2), dark-brown (10YR 4/3), and brownish-yellow (10YR 6/6) mottles or streaks; structureless (single grain) to weak fine granular structure; slightly acid or neutral.

C_3 36 inches +, mottled or variegated dark grayish-brown (10YR 4/2), dark-gray (10YR 4/1), brown (10YR 4/3), yellowish-brown (10YR 5/6), and brownish-yellow (10YR 6/6) very friable fine sandy loam, loamy fine sand, or sandy clay loam; mottles or variegations many, fine, and faint; no well-defined structure; medium acid to neutral; underlain by stratified layers of mottled fine sandy loam, sandy clay loam, loamy fine sand, sand, and gravel.

Included with this soil are about 140 acres of Staser loam and a very few areas of Sequatchie fine sandy loam.

Staser fine sandy loam has very slow to slow surface runoff and medium internal drainage. The soil is medium in plant nutrients and moderate in organic matter. It is slightly acid or neutral to medium acid. It has a high water-supplying capacity. Permeability is moderately rapid throughout the soil. Workability is very good, and the soil can be worked over a wide range in moisture conditions. There is no erosion risk. This soil is highly productive if properly managed.

Staser fine sandy loam, local alluvium phase (Sh) (Capability unit I–1).—This soil differs from Staser fine sandy loam chiefly in its position and color. It also differs in having a wider range in reaction and in depth, and in being underlain by more nearly homogeneous soil material. It occurs in small irregularly shaped areas along small drainageways, at the base of slopes, and in depressions. These areas are less likely to be flooded than areas of Staser fine sandy loam.

Within small areas, this soil varies greatly in color. The color throughout the profile depends mainly on the source of the alluvium and the way it was deposited. The surface soil is generally dark brown or reddish brown in areas where the alluvium has washed from Waynesboro soils. This layer is brown or yellowish brown in areas where the alluvium has washed from Holston soils. The deeper profiles have a range in color that includes brown, dark brown, yellowish brown, light yellowish brown, and brownish yellow. The texture of the surface soil ranges from fine sandy loam to loam. The texture below the surface soil is sandy loam, loam, sandy clay loam, or light clay loam. The depth of the soil ranges from 20 to 48 inches or more.

This soil is neutral to strongly acid. It has a moderate supply of organic matter and is high in fertility. Permeability is moderately rapid throughout the soil. The water-supplying capacity is very high. This soil is very easy to work.

Swaim series

The Swaim series consists of moderately well drained to well-drained, moderately fine textured to fine-textured soils that have developed from old colluvium and local alluvium. These materials have washed from phases of Mimosa, Baxter, and Colbert very rocky soils, and from other upland soils derived from residuum of argillaceous limestone. The Swaim soils occur on gently sloping and sloping foot slopes or benches immediately below steeper slopes of Rockland and Mimosa, Baxter, and Colbert very rocky soils in the extreme eastern part of the county.

The Swaim soils have a surface soil of brown or dark-brown friable to firm silty clay loam to brown, yellowish-brown, or a reddish-brown firm to very firm silty clay. Their subsoil is a reddish-brown, strong-brown, or yellowish-brown very firm clay or silty clay.

In most places the surface soil is friable to firm silty clay loam, but in a few small areas it is friable silt loam. In other areas there is an admixture of sand and the surface soil is loam. The subsoil ranges from brownish-yellow or yellowish-brown to reddish-brown, firm, light silty clay to very firm clay. The depth to mottling and degree of mottling vary considerably within short distances. In places, a few mottles are within 6 or 8 inches of the surface; in other places the soil has no mottles above a depth of 20 inches or more. The depth of the parent colluvium ranges from 2 to 6 feet or more. In places small pieces of chert gravel and small quartz pebbles are distributed through the profile, but they are not numerous enough to interfere with tillage.

Swaim soils are not extensive. They occur mostly in the Waynesboro-Cumberland-Hamblen soil association. A few small areas are in the Cookeville-Cumberland-Hermitage association.

The Swaim soils are associated with the Hermitage soils, Rockland, and with the phases of Mimosa, Baxter, and Colbert very rocky soils. They are not so red as the Hermitage soils and are firmer and finer textured throughout.

About 70 percent of the acreage of Swaim soils is eroded, and 30 percent is severely eroded. Almost all areas have been cleared of the native mixed hardwoods and are used for crops. A few small areas have been abandoned and are reverting to forest, chiefly oak, hickory, and cedar.

Swaim silty clay loam, eroded gently sloping phase (Sm) (Capability unit IIIe-4).—The following describes a profile of this soil in a cultivated area:

A_p 0 to 6 inches, brown (10YR 4/3) or dark-brown (10YR 3/3) friable to firm silty clay loam; weak or moderate very fine to fine subangular blocky structure; range in thickness, 4 to 8 inches.

B_2 6 to 14 inches, reddish-brown (5YR 4/4), strong-brown (7.5YR 5/6), or yellowish-brown (10YR 5/4) very firm clay or silty clay; plastic when wet and very hard when dry; a few, fine, faint, brownish-yellow (10YR 6/6) and light-gray (10YR 7/1) variegations; structureless (massive) or weak medium blocky structure; a few to a moderate number of black concretions and segregations or small pockets.

B_3 14 to 30 inches, variegated brownish-yellow (10YR 6/6) or yellowish-brown (10YR 5/6), strong-brown (7.5YR 5/6), and reddish-brown (5YR 4/4) very firm clay or silty clay; very plastic when wet and very hard when dry; variegations many, fine, and prominent; structureless (massive); many black concretions and segregations or small pockets.

C 30 to 60 inches +, mottled brownish-yellow (10YR 6/6), light-gray (10YR 7/1), strong-brown (7.5YR 5/6), and yellowish-red (5YR 5/6) or red (2.5YR 4/6) very firm clay or silty clay; plastic when wet and very hard when dry; mottles many, fine, distinct to prominent; structureless (massive); a few small quartz pebbles, small pieces of angular chert gravel, and black concretions and segregations.

Included with this soil are about 60 acres of somewhat poorly drained soil that has a surface layer of grayish-brown to dark grayish-brown firable silt loam. This inclusion has a prominently mottled yellow to olive and gray subsoil that contains many black concretions and is almost a claypan. Its slopes are more gentle and lower than those of Swaim silty clay loam, eroded gently sloping phase, and it occurs on an apparently older alluvial terrace.

Swaim silty clay loam, eroded gently sloping phase, has medium to rapid surface runoff. It has slow internal drainage because of its firm, fine-textured subsoil. The soil is medium to strongly acid. It is low in plant nutrients, organic matter, and water-supplying capacity. Permeability is moderately slow in the surface soil. It is slow in the subsoil, and the growth of plant roots is restricted. The soil has only fair workability. It can be worked within only a narrow range of moisture content, and good tilth is difficult to maintain.

Swaim silty clay, severely eroded sloping phase (Sk) (Capability unit IVe-2).—This soil has a more variously colored and firmer surface soil than Swaim silty clay loam, eroded gently sloping phase. Its surface soil ranges from brown to yellowish brown or reddish brown, according to which layer of the original soil is exposed. Because this soil has firm consistence, relatively shallow depth, rapid surface runoff, low water-supplying capacity and plant-nutrient supply, poor tilth, and high erosion risk, it is poorly suited to intertilled crops and only fairly suited to hay or pasture.

Included is about 40 acres that is gently sloping. Also included is about 100 acres that is moderately eroded. This moderately eroded soil has a friable to firm silty clay loam surface soil. It is better suited to intertilled crops than Swaim silty clay, severely eroded sloping phase.

Taft series

The Taft series consists of somewhat poorly drained soils of the terraces. These soils have developed from sediment washed chiefly from soils underlain by limestone. Some of the sediment washed from soils underlain by sandstone. Taft soils occur on level to gently sloping low stream terraces and in depressed areas on old high stream terraces.

The Taft soils have a friable silt loam surface soil. The subsoil is friable to firm mottled silty clay loam that contains a few to many black concretions and some small pieces of chert gravel. The underlying layer is firm silty clay loam or silty clay with many mottles and a few to many small pieces of chert gravel.

The better drained areas of the Taft soils have a less gray surface soil than the poorer drained areas and their subsoil is yellowish brown or brownish yellow and less distinctly mottled. On the low stream terraces of small streams a considerable amount of gravel is distributed through the profile in some places. The depth of the fragipan (B_{3m}) ranges from 18 to 30 inches. In many places this layer is weakly developed, or it does not occur. In some places there is a brown or dark grayish-brown overwash layer. The subsoil contains many concretions in some places but contains none in others.

The Taft soils are widely distributed in small and medium-sized areas. They occur in many soil associations, but their total acreage and agricultural importance are small.

The Taft soils are associated with the Captina and Robertsville soils of the terraces and the Lobelville soils of the bottom lands. They are intermediate in drainage between the moderately well drained Captina soils and the poorly drained Robertsville soils. They are lighter colored than the Captina soils, and their subsoil is mottled at shallower depths. Although similar in drainage, the Taft soils are finer textured than the Tyler soils, which developed from materials that were derived mostly from sandstone.

Taft silt loam (Ta) (Capability unit IIIw-1).—The following describes a profile of Taft silt loam in a cultivated area:

A_p 0 to 6 inches, light brownish-gray (10YR 6/2), grayish-brown (10YR 5/2), or dark grayish-brown (2.5Y 4/2) friable silt loam; weak fine granular structure; strongly or very strongly acid.

A_2 6 to 9 inches, grayish-brown (10YR 5/2) or light brownish-gray (10YR 6/2) friable silt loam; weak very fine subangular blocky structure; strongly or very strongly acid.

A_3 9 to 14 inches, light brownish-gray (10YR 6/2) friable silt loam; a few to a moderate number of fine, faint, grayish-brown (10YR 5/2) and light yellowish-brown (2.5Y 6/4) or light olive-brown (2.5Y 5/4) mottles; weak very fine subangular blocky structure; strongly or very strongly acid.

B_2 or B_{2g} 14 to 25 inches, mottled light brownish-gray (2.5Y 6/2) and olive-yellow (2.5Y 6/6), light olive-brown (2.5Y 5/6), or yellowish-brown (10YR 5/6) friable silty clay loam; mottles many, fine, and faint; weak to moderate fine or medium subangular blocky structure; a few patchy clay skins; a few fine pieces of chert gravel; very few to many black concretions 1.0 to 2.0 millimeters in diameter; strongly or very strongly acid.

B_{3m} 25 to 42 inches, mottled gray (10YR 6/1) or light brownish-gray (2.5Y 6/2), yellowish-brown (10YR 5/6), and strong-brown (7.5YR 5/8) firm silty clay loam; mottles many, fine to medium, and distinct; weak medium blocky structure; patchy clay skins; very few small pockets or seams of gray silty clay; few to a moderate number of small pieces of chert; few to many black concretions or segregations 1.0 to 2.0 millimeters in diameter; strongly acid.

C 42 to 72 inches +, mottled gray, yellowish-brown, yellow and yellowish-red firm silty clay loam or silty clay; mottles many, fine to medium, and prominent; weak medium blocky structure; few to many pieces of chert gravel; strongly or very strongly acid.

Included with this soil are small areas of Robertsville, Lobelville, and Captina soils and of Taft silt loam, overwash phase. Near Beechgrove is a small acreage of phosphatic soil that developed from alluvium derived from phosphatic limestone. This inclusion has slopes of 1 to 4 percent, better drainage, and a larger content of gravel than Taft silt loam, and it is higher above the flood plain. Therefore, it is not subject to flooding.

Taft silt loam has slow surface runoff and internal drainage. The water table is at or near the surface in rainy seasons, especially during winter and early in spring. Permeability is moderate in the surface soil and slow in the subsoil. The water-supplying capacity is moderate. This soil is strongly to very strongly acid and low in organic matter and plant nutrients. It has good workability when not waterlogged. The risk of erosion is slight. Areas on low stream terraces are subject to flooding and those in depressions on high stream terraces are subject to ponding. Drainage by open ditches, bedding, or tilling would broaden the use suitability of this soil.

Taft silt loam, overwash phase (Tb) (Capability unit IIw-1).—This soil has a thicker and better drained surface soil than Taft silt loam. Most of it has a 5- to 12-inch layer of overwash material. This soil occurs on low stream terraces near the base of upland slopes and on the rim of depressions in high stream terraces.

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

A_{p1} 0 to 10 inches, dark grayish-brown (10YR 4/2) or grayish-brown (10YR 5/2) friable silt loam; smooth diffuse lower boundary.

A_{p2} 10 to 15 inches, grayish-brown (10YR 5/2) or light brownish-gray (10YR 6/2) friable silt loam.

A_3 15 to 22 inches, grayish-brown (10YR 5/2) to light olive-brown (2.5Y 5/4) friable silt loam; a few, fine, faint, yellowish-brown (10YR 5/6) mottles.

B_2 or B_{2g} 22 to 34 inches, mottled light brownish-gray (2.5Y 6/2), olive-yellow (2.5Y 6/6), and light olive-brown (2.5Y 5/6) or yellowish-brown (10YR 5/6) friable silty clay loam; mottles many, fine, and faint.

B_{3m} 34 to 45 inches +, mottled light brownish-gray (2.5Y 6/2) or gray (10YR 6/1), yellowish-brown (10YR 5/6), and strong-brown (7.5YR 5/8) firm silty clay loam; mottles many, fine to medium, and distinct.

Taft silt loam, overwash phase, is strongly to very strongly acid, low to moderate in organic matter, and low to medium in fertility. Permeability is moderate in the surface soil and slow in the subsoil. The water-supplying capacity is moderate to high. This soil has good to very good workability.

Because it has washed from Cumberland, Waynesboro, Baxter, Cookeville, Mountview, Dickson, and other soils, many colors occur in the overwash layer. The surface soil generally is dark grayish brown or grayish brown, but within small areas it ranges from brown or reddish brown to gray. This range in color depends on the source of the alluvium, local drainage, and the length of time the materials have been in place.

Talbott series

The Talbott series consists of well-drained upland soils. These soils have formed from residuum of cherty argillaceous limestone on strongly sloping ridge and karst relief.

Talbott soils have a surface soil of reddish-brown or brown friable to firm cherty silty clay loam. Their subsoil is a yellowish-red or reddish-brown firm cherty silty clay loam or silty clay to red or dark-red very firm cherty clay.

The color and texture of the surface soil depend on the the degree of erosion. In some small areas the B_2 horizon is exposed. Also exposed are small remnants of the soils of the old high stream terraces. These soils are as thick as 18 inches. Outcrops of bedrock and shallow gullies are common in some places.

The Talbott series has only one soil mapped in Coffee County. It occurs in only the Mountview-Baxter-Lobelville soil association. Most of it is immediately east of Bean Creek at United States Highway No. 41 and extending northeastward to Stephenson.

Talbott soils are associated with the Baxter, Cumberland, and Waynesboro soils. The Talbott soils resemble the Baxter soils in general appearance, but they are shallower to the firmer and more clayey subsoil. They are similar to the Mimosa soils in texture and consistence, but they are much redder, much more cherty, and low in phosphorus.

Talbott cherty silty clay loam, severely eroded strongly sloping phase (Tc) (Capability unit VIe-1).—The following describes a profile of this soil in a cultivated area:

A_p 0 to 6 inches, reddish-brown (5YR 4/4) or brown (10YR 4/3 or 7.5YR 4/4) friable to firm cherty silty clay loam;

weak to moderate very fine or fine subangular blocky or fine granular structure.

B_1 6 to 11 inches, yellowish-red (5YR 5/6) or reddish-brown (5YR 4/4) firm cherty silty clay loam or silty clay; moderate fine subangular blocky and blocky structure; patchy clay skins.

B_2 11 to 24 inches, red (2.5YR 5/6) or dark-red (2.5YR 3/6) very firm (plastic when wet and very hard when dry) cherty clay; a few, fine, prominent, brownish-yellow (10YR 6/6) variegations; strong fine and medium blocky structure; continuous clay skins.

B_3 24 to 36 inches, red (2.5YR 4/6) or dark-red (2.5YR 3/6) very firm cherty clay; a moderate number of fine, prominent, brownish-yellow (10YR 6/6) variegations; strong fine and medium blocky structure; continuous clay skins.

C 36 to 60 inches +, variegated red (2.5YR 4/6), dark-red (2.5YR 3/6), brownish-yellow (10YR 6/6), and light-gray (10YR 7/2 or 7/1) very firm cherty clay; variegations many, fine and prominent; moderate medium and coarse blocky structure; many angular chert fragments (geodes in some places) ½ to 6 inches in diameter and very few small pockets of olive-colored shale particles.

About 40 percent of this mapping unit has sloping relief. About 15 percent of the total acreage is eroded, and 85 percent is severely eroded. Many shallow gullies occur in less than 0.5 percent of the total acreage. A few of the gullies are so deep that farm machinery cannot cross them.

Talbott cherty silty clay loam, severely eroded strongly sloping phase, has rapid to very rapid surface runoff and slow internal drainage. It is strongly acid, low in plant nutrients, and very low in organic matter. It has a low water-supplying capacity. The permeability is slow throughout the profile, and the very firm clay in the subsoil restricts the growth of plant roots. This soil has poor workability, largely because of its strong slopes, chertiness, and firm consistence. It can be tilled only within a narrow range in moisture content, and it clods readily if plowed when too wet or too dry. The risk of erosion is very high.

About 80 percent of this soil is used for pasture and 10 percent for crops; about 10 percent is idle. Most of the idle soil is reverting to forest.

Tyler series

The Tyler series consists of deep to very deep somewhat poorly drained soils that occur on nearly level to gently sloping positions on terraces. The largest acreage occurs in flats or depressions. They have developed in old alluvium washed from upland soils that were derived from residuum of acid sandstone and some limestone.

The Tyler soils generally have a gray or grayish-brown to light yellowish-brown or light brownish-gray very friable surface soil. Their subsoil is mottled, friable, heavy loam or light clay loam, or friable to firm clay loam. It is underlain by a firm, compact fragipan at depths of 18 to 24 inches.

The depth to the fragipan and its thickness and development vary considerably from area to area and within short distances in the same area. The fragipan ranges in thickness from 6 to 24 inches or more. In many places it is only weakly developed, or it does not occur. The texture of the B_2 horizon, B_{3m}, and C layers is clay loam, silty clay loam, sandy clay loam, or fine sandy loam. In disturbed or cultivated areas the surface soil is light brownish gray or gray.

The Tyler soils occur mostly in the Waynesboro-Cumberland-Hamblen soil association. They also occur in small acreages in the Dickson-Mountview-Lobelville association. These soils are not extensive or very important to agriculture.

The Tyler soils are associated with the Holston, Monongahela, Purdy, and Whitwell soils. They are less brown, less well drained, and more mottled than the Monongahela soils. They are less mottled and better drained than the Purdy soils. The Tyler soils are less brown, less well drained, younger, and less productive than the Whitwell soils, which have no fragipan. They are similar to the Taft soils in relief and drainage but differ chiefly in being coarser textured and in being derived from a different kind of parent material.

Tyler loam (Td) (Capability unit IIIw-1).—The following is a profile description of this soil in a forested area:

A_{00} and A_0 1 to 0 inch, forest litter and leaf mold.

A_1 0 to 2 inches, gray (10YR 5/1) or grayish-brown (2.5Y 5/2) very friable loam; weak fine granular structure; strongly or very strongly acid; range in thickness, ½ to 2 inches.

A_2 2 to 6 inches, pale-yellow (2.5Y 7/4) or light yellowish-brown (2.5Y 6/4 or 10YR 6/4) very friable loam; few, fine, faint, brownish-yellow (10YR 6/6) and gray (10YR 6/1) mottles or organic stains; weak fine granular or very fine subangular blocky structure; very strongly acid; range in thickness, 4 to 7 inches.

B_1 6 to 12 inches, light yellowish-brown (2.5Y 6/4 or 10YR 6/4) friable heavy loam or light clay loam; moderate number of fine, distinct, gray (10YR 6/1) mottles; weak very fine or fine subangular blocky structure; strongly or very strongly acid.

B_2 12 to 22 inches, mottled light-gray (10YR 7/1 or 6/1), yellowish-brown (10YR 5/6), brownish-yellow (10YR 6/6), light yellowish-brown (2.5Y 6/4), and pale-yellow (2.5Y 7/4) friable to firm clay loam; mottles many, fine, and distinct; weak to moderate fine and medium subangular blocky structure; a few small quartzite pebbles and fine pieces of chert gravel; strongly or very strongly acid.

B_{3m} 22 to 38 inches, mottled light-gray (10YR 7/1) or light brownish-gray (2.5Y 6/2), brownish-yellow (10YR 6/8), yellow (10YR 7/6), and strong-brown (7.5YR 5/8) firm compact clay loam that is friable when crushed; mottles many, fine to medium, and distinct; weak medium to coarse blocky or platy structure; structureless (massive) in place; a few small quartzite pebbles and fine pieces of chert gravel; strongly or very strongly acid.

C 38 to 54 inches +, mottled light-gray (10YR 7/1), brownish-yellow (10YR 6/6), strong-brown (7.5YR 5/8), and yellowish-red (5YR 5/8) friable to firm clay loam, silty clay loam, or sandy clay loam; all the mottles except the yellowish-red ones are many, medium to coarse, and prominent; the yellowish-red mottles are few, fine to medium, and prominent; weak medium blocky structure; a moderate number of small quartzite pebbles and fine pieces of chert gravel; strongly or very strongly acid; underlain by widely variable stratified or laminated clays, silts, sand, and gravel, but clay predominates; these materials, in turn, are underlain by limestone residuum.

Included are small areas of Purdy and Monongahela soils and Tyler loam, overwash phase. Also included are a few small areas of Tyler fine sandy loam, which are not mapped separately.

Tyler loam has slow to very slow surface runoff and internal drainage. A fluctuating water table is at or near the surface in winter and spring. Many areas are likely to be ponded and flooded. The soil is strongly to very strongly acid. Cultivated areas are low in organic matter and plant nutrients. Permeability is moderate in the surface soil if it is not saturated with water. Permeability in the subsoil is slow. Ordinarily, the soil has a moderate water-supplying capacity, but in extended dry seasons its water-supplying capacity is low. Workability is good if moisture is favorable. The risk of erosion is slight.

About 55 percent of this soil is in mixed hardwoods, chiefly sweetgum, blackgum, maple, oak, and hickory. Most of the cleared land is used for pasture and hay. A small part is used for corn, soybeans, sorghum, and small grain.

Tyler loam, overwash phase (Te) (Capability unit IIw-1).—This soil has a thicker and somewhat better drained surface soil than Tyler loam. A 5- to 12-inch overwash layer has alluvium washed from higher lying slopes occupied chiefly by the Waynesboro, Holston, Monongahela, and Nolichucky soils. This soil occurs in small shallow depressions or in narrow areas between the base of slopes and the boundary of larger areas of Tyler loam.

The following is a profile description of this soil in a cultivated area:

A_{p1} 0 to 10 inches, grayish-brown (10YR 5/2) very friable loam; a few fine, brown (10YR 5/3) and dark grayish-brown (10YR 4/2) stains; smooth diffused lower boundary; 5 to 12 inches thick.

A_{p2} 10 to 15 inches, light brownish-gray (10YR 6/2) very friable loam; a few, fine, faint yellowish-brown (10YR 5/4) mottles.

B_1 15 to 22 inches, mottled light brownish-gray (10YR 6/2), light yellowish-brown (2.5Y 6/4), pale-brown (10YR 6/3), and yellowish-brown (10YR 5/6) friable heavy loam or light clay loam; mottles many, fine, and faint.

B_2 22 to 32 inches, mottled yellowish-brown (10YR 5/6) and brownish-yellow (10YR 6/6) or light brownish-gray (2.5Y 6/2) friable to firm clay loam; mottles many, fine, and distinct.

B_{3m} 32 to 45 inches, mottled light-gray (10YR 7/1), gray (10YR 6/1), yellowish-brown (10YR 5/6), and brownish-yellow (10YR 6/6) firm compact clay loam or sandy clay loam; mottles many, fine to medium, and distinct.

The surface soil is generally grayish brown or light brownish gray but ranges locally from brown to gray. This range in color depends mainly on the source of the materials, length of time the materials have been in place, and local drainage.

Inclusions consist of small areas of Tyler loam; Purdy loam, overwash phase; Monongahela soils; Hamblen fine sandy loam, local alluvium phase; and Whitwell soils. Also included are areas of Tyler soil in which the overwash layer is fine sandy loam.

Tyler loam, overwash phase, has slow surface runoff and internal drainage. This soil is strongly to very strongly acid and low in organic matter and fertility. The surface soil is moderately permeable, and the subsoil is slowly permeable. The soil has a moderate to high water-supplying capacity. Workability is good to very good.

Practically all areas have been cleared and are used mostly for pasture, hay, corn, soybeans, sorghums, and small grain. The soil is better suited to intertilled crops than Tyler loam, mainly because its surface soil is better drained.

Waynesboro series

The Waynesboro series consists of deep to very deep well-drained red soils of the terraces. They have developed in gently sloping or sloping areas on high stream terraces in old alluvium. This alluvium washed mostly from upland soils underlain by sandstone. Some of the upland soils were underlain by limestone.

The Waynesboro soils have a surface soil that is very friable to firm dark grayish brown, very dark grayish brown, brown, yellowish brown, reddish brown, red, or dark red. Its subsoil is friable to firm and yellowish red to red or dark red.

The alluvial deposit in which the Waynesboro soils have formed ranges in depth from about 2 feet to 10 feet or more. These soils are firmer and finer textured where the deposit is thin over limestone residuum than they are where the deposit is 4 feet or more thick. Pieces of chert gravel are common in many areas, especially in the shallower and more exposed areas. Some areas have a brown, dark-brown, or reddish-brown surface soil.

The Waynesboro soils occur in a large acreage in the Waynesboro - Cumberland - Hamblen soil association. They occur in smaller areas in the Dickson-Mountview-Lobelville and the Holston-Monongahela-Tyler associations. The Waynesboro soils are moderately extensive and important to farming.

Waynesboro soils are associated with the Cumberland, Etowah, Nolichucky, and Holston soils. They are coarser textured, somewhat more friable, and lighter colored than the Cumberland soils. They are more sandy than the Etowah and redder in the lower part of their profile. The Waynesboro soils are similar to the Holston and Nolichucky soils in texture and consistence but differ in color.

About 50 percent of the total acreage of Waynesboro soils is eroded, 35 percent is severely eroded, and 15 percent is uneroded or only slightly eroded. The forests consist of oak, hickory, and poplar with scatterings of walnut, locust, black cherry, dogwood, maple, and redcedar.

Waynesboro loam, gently sloping phase (Wd) (Capability unit IIe-1).—The following is a profile description of this soil in a forested area:

A_{00} and A_0 1 to 0 inch, forest litter and leaf mold; range in thickness, 0 to 1 inch.

A_1 0 to 1 inch, dark grayish-brown (10YR 4/2) or very dark grayish-brown (10YR 3/2) very friable loam stained with organic matter; weak very fine granular or crumb structure; strongly acid.

A_2 1 to 7 inches, brown (10YR 4/3 or 5/3) or yellowish-brown (10YR 5/4) very friable loam; weak fine granular structure; strongly acid; range in thickness, 4 to 8 inches.

A_3 7 to 11 inches, brown (7.5YR 4/4) or reddish-brown (5YR 4/4) friable or very friable loam; weak very fine or fine subangular blocky structure; strongly or medium acid; range in thickness, 2 to 5 inches.

B_1 11 to 18 inches, yellowish-red (5YR 5/6 to 4/6) friable light clay loam or silty clay loam; weak to moderate fine subangular blocky structure; patchy clay skins; an occasional to a few fine pieces of chert gravel and small quartzite pebbles; strongly acid to medium acid.

B_2 18 to 38 inches, dark-red (2.5YR 3/6) or red (2.5YR 4/6) friable to firm clay loam, silty clay loam, or silty clay; moderate fine and medium subangular blocky structure; patchy to continuous clay skins; a few fine pieces of chert gravel and small quartzite pebbles; strongly or medium acid; range in thickness, 10 to 20 inches.

B_3 38 to 54 inches, red (2.5YR 4/6) or dark-red (2.5YR 3/6) friable to firm clay loam, silty clay loam, or silty clay; a few to a moderate number of fine, distinct, reddish-yellow (7.5YR 6/8) or brownish-yellow (10YR 6/6) variegations; moderate fine and medium blocky and subangular blocky structure; patchy to continuous clay skins; a few black concretions 1.0 millimeter in diameter; a few to a moderate number of pieces of chert gravel and small quartzite pebbles; strongly acid.

C 54 to 72 inches +, red (2.5YR 4/6) or dark-red (2.5YR 3/6) friable silty clay, clay, clay loam, or sandy clay; many, prominent, fine reddish-yellow (7.5YR 6/6) or brownish-yellow (10YR 6/6) variegations and a few, fine, prominent, gray (10YR 6/1) or light brownish-gray (10YR 6/2) variegations; moderate medium blocky structure; patchy clay skins on vertical faces of structure peds; a few to a moderate number of pieces of chert gravel and small quartzite pebbles; strongly acid; underlain by limestone residuum.

The surface runoff is slow to medium and internal drainage is medium. This soil is strongly acid to medium acid, medium in plant nutrients, and moderate in organic matter. Permeability is moderately rapid in the surface soil and moderate in the subsoil. The water-supplying capacity is moderate. Workability is very good. The erosion risk is slight to moderate.

Waynesboro loam, eroded gently sloping phase (We) (Capability unit IIe-1).—This soil differs from Waynesboro loam, gently sloping phase, in having a thinner brown to dark-brown or reddish-brown surface soil. A few conspicuous spots of the reddish subsoil are exposed in places.

Waynesboro loam, sloping phase (Wf) (Capability unit IIIe-1).—This soil has stronger relief and a slightly less average depth than Waynesboro loam, gently sloping phase. It has good workability and moderate erosion risk. All of this soil is in forest of mixed hardwoods.

Waynesboro loam, eroded sloping phase (Wg) (Capability unit IIIe-1).—This soil differs from Waynesboro loam, gently sloping phase, in having a shallower surface soil that is more variable in color and texture. The surface layer ranges from a brown very friable loam to a yellowish-red friable clay loam.

The surface runoff and internal drainage of this soil are medium. Permeability is moderate. The soil has good workability. The risk of erosion is moderate.

Waynesboro loam, strongly sloping phase (Wh, Wk) (Capability unit IVe-1).—This soil formed in alluvium that is shallower and more variable in depth than the alluvium in which Waynesboro loam, gently sloping phase, formed. All of this soil is in mixed hardwoods forest.

This soil has rapid surface runoff and medium internal drainage. Permeability is moderately rapid in the surface soil and moderate in the subsoil. The water-supplying capacity is moderate and workability is only fair. The erosion risk is high.

Included with this soil are a number of eroded areas and a few areas that have slopes of 20 to 25 percent. A few areas along the Elk River near Rutledge Hill in the southeastern part of the county are somewhat lighter colored and coarser textured throughout.

Waynesboro clay loam, severely eroded gently sloping phase (Wa) (Capability unit IIIe-1).—This soil has a redder and firmer surface layer than Waynesboro loam, gently sloping phase. This layer is mostly reddish-brown or yellowish-red friable clay loam, but in places the red subsoil is exposed. In places where erosion has been less severe, much of the browner loam of the original surface soil remains. This soil is less well suited to crops than Waynesboro loam, gently sloping phase.

Waynesboro clay loam, severely eroded sloping phase (Wb) (Capability unit IIIe-1).—This soil has a redder and firmer surface soil than Waynesboro loam, gently sloping phase. The present surface soil varies considerably from place to place in color, texture, and consistence, according to the depth to which the original soil has been removed by erosion or the amount of subsoil material that has been mixed in the plow layer. In about 80 acres gullies have developed. These gullies are generally shallow. Many can be obliterated by cultivation, but a few are deep enough to interfere with tillage. This soil is poorly suited to intertilled crops.

Waynesboro clay loam, severely eroded strongly sloping phase (Wc) (Capability unit VIe-1).—This soil has a redder and firmer surface soil than Waynesboro loam, gently sloping phase. The surface soil varies greatly from place to place in depth, color, consistence, and texture. Typical areas have intricate patterns of brown or reddish-brown loam spots and larger areas of yellowish-red, red, or dark-red friable to firm clay loam, silty clay loam, or silty clay. Limestone residuum is exposed in small spots on the more severely eroded slopes, and a few gullies have formed. On about 50 acres of this soil the gullies greatly hamper tillage or make it impractical. Special management is needed to reclaim these gullied areas. This soil is poorly suited to intertilled crops and is only fairly suited to pasture.

Whitwell series

The Whitwell series consists of deep to very deep moderately well drained soils of the terraces. They have developed on low stream terraces from alluvium washed chiefly from soils underlain by sandstone. In some places this alluvium contains an admixture of materials from soils underlain by limestone.

The Whitwell soils have a very friable loam surface layer. Their subsoil is friable or very friable, mottled light clay loam, fine sandy loam, or fine sandy clay loam. It contains a few small quartzite pebbles, fine pieces of chert gravel, and a few small, black and brown concretions and stains in the lower part.

The surface soil varies in color from place to place and is dark brown, brown, grayish brown, and dark grayish brown.

The subsoil ranges from clay loam to fine sandy loam or fine sandy clay loam in most places. In a few areas that occur in depressions in association with Cumberland and Waynesboro soils, the subsoil consists of heavy silt loam or silty clay loam. The depth to mottling and the degree of mottling vary considerably. In a few places a weakly developed fragipan replaces the B_3 horizon.

Principal areas of the Whitwell soils occur on the low terraces along Bradley, Bean, and Betsy Willis Creeks and their tributaries in the Waynesboro-Cumberland-Hamblen soil association. Small acreages are in the Dickson-Mountview-Lobelville and the Holston-Monongahela-Tyler associations. These soils are not extensive but they are important to farming.

Whitwell soils are associated with the Sequatchie soils of the low stream terraces and with the Staser, Hamblen, Prader, and Dunning soils of the first bottoms. They are less well drained than the Sequatchie soils, generally have a lighter colored surface layer and a more yellowish subsoil, and are more mottled. They are somewhat similar to the moderately well drained Monongahela and somewhat poorly drained Tyler soils but are generally browner, apparently younger, more productive, and do not have a fragipan layer.

Whitwell loam, gently sloping phase (Wn) (Capability unit IIw-1).—A profile description of this soil in a cultivated area follows:

A_p 0 to 6 inches, dark grayish-brown (10YR 4/2) or brown (10YR 4/3) very friable loam; weak fine granular or crumb structure; strongly acid to medium acid.

A_2 6 to 10 inches, yellowish-brown (10YR 5/4), light yellowish-brown (10YR 6/4), or brown (10YR 5/3) very friable loam; weak very fine subangular blocky structure; strongly acid to medium acid.

B_1 10 to 14 inches, yellowish-brown (10YR 5/4) or light yellowish-brown (10YR 6/4) friable or very friable loam, light clay loam, or fine sandy loam; weak very fine or fine subangular blocky structure; medium acid.

B_2 14 to 22 inches, light yellowish-brown (10YR 6/4 or 2.5Y 6/4), yellowish-brown (10YR 5/6), or brownish-yellow (10YR 6/6) friable light clay loam, fine sandy loam, or fine sandy clay loam; a few, fine, faint gray (10YR 6/1) or light brownish-gray (10YR 6/2) mottles; weak to moderate very fine subangular blocky structure; a few small quartzite pebbles and fine pieces of chert gravel; an occasional to a few small black concretions or stains; medium to strongly acid; range in thickness, 8 to 15 inches.

B_3 22 to 38 inches, mottled brownish-yellow (10YR 6/6), light yellowish-brown (10YR 6/4), light-gray (10YR 7/1), and yellow (2.5Y 7/6) friable light clay loam, fine sandy loam, or fine sandy clay loam; mottles common, fine, and distinct; weak to moderate fine or medium subangular blocky structure; a few small quartzite pebbles, fine chert gravel, and small black and brownish concretions and stains; strongly acid; range in thickness, 6 to 18 inches.

C 38 to 50 inches +, mottled brownish-yellow (10YR 6/8 to 6/6), light-gray (10YR 7/1), and yellow (2.5Y 7/6) or pale-yellow (2.5Y 7/4) friable clay loam, fine sandy loam, or fine sandy clay loam; mottles many, fine to medium, distinct; weak fine or medium subangular blocky structure; variable number of fine pieces of chert gravel and small quartzite pebbles; strongly acid.

The principal inclusion is Whitwell fine sandy loam, gently sloping phase, and there are also small areas of Whitwell silt loam. These soils are not mapped separately in Coffee County. Also included are small areas of Tyler and Sequatchie soils.

Whitwell loam, gently sloping phase, has slow surface runoff and slow to medium internal drainage. Many areas are likely to be flooded, usually for a short period. Areas in depressions may be ponded in periods of heavy rainfall. The soil is medium to strongly acid, medium in plant nutrients, moderate in organic matter, and moderate to high in water-supplying capacity. Permeability is moderate in the surface soil and moderately slow in the subsoil. The soil has good workability, and good tilth is easy to maintain. The soil can be worked within a fairly wide range in moisture content.

Whitwell loam, eroded gently sloping phase (Wo) (Capability unit IIw–1).—This soil differs from Whitwell loam, gently sloping phase, chiefly in having a thinner surface soil that averages about 6 inches in thickness. In a few places where this soil has been sheet eroded or scoured by floodwaters, the plow layer consists of an admixture of original surface soil and subsoil material, or it consists entirely of the original subsoil. The more eroded spots generally have a yellowish-brown plow layer. In many places the areas have microrelief. The slopes are seldom stronger than 3 or 4 percent. This soil has good workability. The erosion hazard is slight. Productivity is medium.

Whitwell loam, level phase (Wm) (Capability unit IIw–1).—This soil has slightly slower surface runoff and somewhat slower internal drainage than Whitwell loam, gently sloping phase. It is more likely to be flooded because it generally occupies lower positions on stream terraces.

Genesis, Classification, and Morphology of Soils

Soil is the product of the forces of weathering and soil development acting on parent material deposited or accumulated by geologic agencies. The characteristics of the soil at any given point depends on (1) the physical and mineralogical composition of the parent material; (2) the climate under which the soil material has accumulated and has existed since accumulation; (3) the plant and animal life in and on the soil; (4) the relief, or lay of the land; and (5) the length of time the forces of soil development have acted on the material (*9*). The effects of climate on soil and plants depend not only on temperature, rainfall, and humidity but also on the physical characteristics of the soil or soil material and on the relief, which in turn influences drainage, aeration, runoff, erosion, and exposure to sun and wind.

Climate and vegetation are the active factors of soil genesis. They act on the parent material and change it from a mass of inert material to a body that has definite morphology. The effects of climate and vegetation on the parent material are modified by relief, which affects runoff, drainage, and natural erosion. The parent material itself influences soil formation and is important in affecting the temperature and moisture of the soil and the kind of vegetation that grows. Because it takes time for the effects of these slow natural processes to become apparent in the soil, the age of a soil reflects its degree of development into a body that is in equilibrium with its environment. The degree of such development depends not only on time but also on the rate at which the forces of climate and vegetation act. This rate is affected by the relief and parent material.

The outstanding morphology of the soils of Coffee County, as related to the factors of soil formation, are described in the following pages. Physical and chemical data are limited for these soils, and the discussion of soil genesis and morpology is correspondingly incomplete. The first subsection deals with the environment under which the soils exist; the second, with the classification of soils by categories; the third, with specific soil series and the part environment has played in determining the morphology of the various kinds of soil.

Factors of Soil Formation in Coffee County

Parent material

The parent material of the soils of Coffee County can be considered in two broad classes: (1) Materials residual from the weathering of rocks in place; and (2) materials transported by water or gravity and laid down as unconsolidated deposits of clay, silt, sand, and rock fragments. The residual materials are related directly to the underlying rocks from which they were derived. The transported materials are related to the soils or rocks from which they fell or were washed.

The residual parent materials are the residuum from the weathering of consolidated and unconsolidated sedimentary rock. These rocks were laid down as sediments from limestone, sandstone, shale, loess, and other material, and most of them were gradually converted into consolidated rocks. Geologically, the rocks are very old. Most of the rock formations deviate only slightly from the horizontal. The rocks that developed in place show a relationship to their parent rock that is more apparent than that shown by soils consisting of alluvium, because alluvial deposits are largely mixtures of materials from many kinds of parent rocks.

Although a fairly consistent relationship exists between the kinds of parent materials and some of the soil properties, other properties are not related to parent materials but are attributable to other factors.

Climate

Coffee County has long warm summers, short mild winters, and relatively high rainfall. The moderately high temperature induces rapid chemical reactions under the moist conditions that exist in the soil most of the time. Because of the high rainfall, soluble and colloidal materials are leached downward in the soil. The soil is frozen only for brief periods and to shallow depths; consequently, weathering and translocation of material goes on most of the time.

Although the climate of the county is fairly uniform, variations in slope and exposure and differences in elevation cause some small local difference in climate. Some of the differences in the soils of the Cumberland Plateau and those of the Highland Rim and Central Basin can be attributed to differences in climate. The difference in the soils arising from difference in climate, however, are less than those arising from differences in parent material.

The average soil temperature on the south- and west-facing slopes generally is somewhat higher than that on the north- and east-facing slopes. The average moisture content of the soils is less on the south and west slopes than on the north and east slopes. These moisture and temperature conditions affect the length of time that the soil is frozen and the growth of vegetation. Although the differences of moisture and temperature are small, possibly they cause some of the local variations in soils derived from similar parent material.

In this county, differences in climate are not great enough to account for the broad differences that exist among the soils. The climate of most of the county is characteristic of the climates of both the Red-Yellow Podzolic and Gray-Brown Podzolic soil regions. The Red-Yellow Podzolic and Gray-Brown Podzolic soils occur in intimate association in many parts of the county. It is apparent that differences in such factors as parent material, relief, and time have been of primary importance in determining the broad differences in the soils.

Plant and animal life

Vegetation, micro-organisms, earthworms, and other forms of life that live on and in the soil contribute to its development. The changes that these organisms bring about vary with the kind of life and life processes of each. The kinds of plants and animals that live on and in the soil are determined by the climate and many other factors of the environment. Although climate is most apparent, it is not always most important in determining the kind of vegetation that grows.

Oak-hickory forest generally was on most of the well-drained, well-developed soils, although locally there may have been much chestnut, yellow-poplar, beech, walnut, or locust in the forest stands. There were probably differences in the density of stands, the relative proportion of species, and the ground cover. In the area as a whole, however, the forests were relatively uniform, and probably none of the marked differences in the well-drained, well-developed soils are the direct results of differences in vegetation.

Most of the present trees are moderately deep to deep feeders on plant nutrients, and they shed their leaves annually. Although the content of plant nutrients in the leaves of different species varies considerably, the quantity of bases and phosphorus returned to the soil by deciduous trees is generally higher than that returned by coniferous trees. Through the decay of leaves some essential plant nutrients derived from the lower part of the soil are returned to the upper part. These nutrients tend to offset the loss caused by the depleting action of percolating waters.

Much organic material is added to the soil in the form of dead leaves, roots, and entire plants. Most of it is added to the A horizon, or topmost layer, where it is acted upon by micro-organisms, earthworms, and other forms of life, and by direct chemical reactions. In Coffee County the rate of decomposition of such materials is rather rapid because temperature and moisture are favorable and the organic material does not unduly resist decomposition. Organic material does not accumulate on well-drained sites in this area to the extent that it does in cooler regions having similar drainage. Little is known of the micro-organisms, earthworms, and other forms of life in the soils of the county. The effects of these organisms, though probably not equal to the effects of vegetation, are nonetheless important to soil genesis.

Relief

The relief of the soils modifies the effects of climate and vegetation. The soils range from level on first bottoms and some uplands to hilly, steep, and broken in many places near streams. On some steep slopes runoff is so great that geologic erosion keeps almost even pace with rock weathering and soil formation. The soil materials do not remain in place long enough to allow formation of a profile having genetically related horizons. The quantity of water that percolates through the soil is small, and the amount of material leached and washed downward is correspondingly small.

Time

Soil material that has been in place for a short time has been altered very little by climate and vegetation and has not formed a well-defined profile of genetically related horizons. Most of the soils on the first bottoms along streams are of this kind. Also of this kind are soils on steep slopes. Soil material on steep slopes is removed by geological erosion almost as fast as the soil is replenished by the weathering of rock; consequently a genetic soil profile has little opportunity to form. These two kinds of soils are young or very young soils.

If relief and other factors of soil genesis are favorable, soil material remains in place and eventually develops into a soil that has reached approximate equilibrium with its environment. Such a soil is considered mature, or old.

In some nearly level or undulating areas where internal drainage is slow and the parent material has been in place for a long time, soils have developed that have a very firm or compacted layer within their profile. In some places a light-colored considerably leached layer has developed over the compact layer. Mottles occur in the compacted layer of some of these soils. This kind of profile development indicates that the soils may be very old.

Classification of Soils

Soils are classified at several levels. The lowest three—phase, type, and series—are discussed in the section, Soil Survey Methods and Definitions. Soil series may be grouped into higher categories. The highest category is called the soil order and consists of three divisions—zonal, intrazonal, and azonal. Subdivisions within each order are called great soil groups (*2*).

Zonal soils are defined as those great groups of soils having well-developed characteristics that reflect the influence of the active factors of soil genesis—climate and living organisms, chiefly vegetation (*2*). In the virgin condition all the zonal soils have a layer of organic debris in varying stages of decomposition on the surface. All have an A_1 horizon. The A_2 horizon is lighter in color than either the A_1 or the B. The B horizon is generally yellowish brown, brown, or red and is finer textured than the A_1 and A_2. The C horizon is variable in color and texture among the different soils, but it is usually reddish or yellowish mottled with gray or brown. In Coffee County the great soil groups classified as zonal soils are Red-Yellow Podzolic soils, Reddish-Brown Lateritic soils, and Gray-Brown Podzolic soils.

Intrazonal soils are any of the great groups of soils having more or less well-developed soil characteristics that reflect the dominating influence of some local factor of relief, parent material, or age over the normal effect of the climate and vegetation. Each group of these soils may occur in association with two or more of the zonal groups (*2*). In this area the properties of the intrazonal soils are mainly the result of the influence of the nearly level relief, but the development of the soils also has been influenced greatly by the parent material, its underlying material, and the vegetation. The intrazonal soils in this county are members of the Planosols, Low-Humic Gley, and Humic Gley great soil groups.

Azonal soils are any of the great groups of soils that do not have well-developed profile characteristics, because they are so young or have such parent material or relief that normal soil-profile characteristics cannot develop (*2*). The azonal soils have (1) an A_1 horizon that is moderately dark in color and apparently moderately to fairly high in organic matter; (2) no zone of illuviation, or B horizon; and (3) parent material that is usually lighter in color than the A_1 horizon and that may be similar to but coarser than or finer than the A_1 horizon in texture. Azonal soils may be referred to as AC soils because of the absence of a B horizon. Azonal soils in this county are members of the Regosols, Lithosols, and Alluvial soils great soil groups.

Differences in the morphology of the soils throughout the county have been produced mainly by three factors—parent material, relief, and time. Climate and vegetation are not major factors in developing differences, apparently because they have been relatively uniform throughout the county.

The classification of soil series in higher categories is made principally on the basis of characteristics that are observable in the field. The classification of some of the series, however, may not be correct Further study may make modifications necessary.

Morphology of Soils Representing the Great Soil Groups

Red-Yellow Podzolic soils

The Red-Yellow Podzolic great soil group consists of well-developed, well-drained, acid soils that have thin organic (A_0) and organic-mineral (A_1) horizons over a light-colored, bleached (A_2) horizon, over a red, yellowish-red, or yellow more clayey (B) horizon. The parent materials are all more or less siliceous. Coarse reticulate streaks or mottles of red, yellow, brown, and light gray are characteristic of deep horizons of Red-Yellow Podzolic soils where parent materials are thick.[4]

Red-Yellow Podzolic soils have developed under deciduous, coniferous, or mixed forest in moist, warm-temperate to tropical climates. In cultivated areas the A_0 and A_1 horizons are mixed in the plow layer. In many places accelerated erosion has removed all or nearly all of the A horizon and left the B exposed. The clay fraction is dominated by kaolinite but contains some free ferric oxides or hydroxides and, in places, a small amount of aluminum hydroxide. Hydrous mica and montmorillonite occur in some of the soils, but these are not considered typical. In any specific parent material the reticulate streaks generally occur higher in the profiles that have yellow B horizons than in those that have red B horizons. In a few of the Red-Yellow Podzolic soils, especially the very sandy ones, the streaked material does not occur. Other well-developed, well-drained red and yellow soils that do not have podzolic morphology are associated with Red-Yellow Podzolic soils.

Red-Yellow Podzolic soils are developed by podzolization and laterization. Podzolization is a term that refers to the processes of soil development through which soils are depleted of bases, become acid, and develop eluvial A horizons (surface layers of removal) and illuvial B horizons (lower horizons of accumulation). The term also refers to the processes by which a Podzol is developed. Through these processes, iron and alumina are more rapidly removed from the surface horizons than silica. The term is also used to include similar processes by which certain other soils of humid regions are formed. Laterization is the process through which Laterites and lateritic soils are developed. Essentially it is the process of the silica removal with consequent increase in content of alumina and iron oxide and decrease in the base-exchange capacity of the soil.

In Coffee County the Red-Yellow Podzolic soils have developed under a mixed deciduous forest. They are well drained. Although they range somewhat in degree of maturity, all are old enough to have a Red-Yellow Podzolic soil profile that is at least moderately well developed. The parent materials of Red-Yellow Podzolic soils differ markedly, and many of the different soil profiles can be correlated with differences in parent materials. These soils are level to moderately steep; but differences among the soil profiles are probably not related primarily to differences in slope.

[4] Description from report of Subcommittee on Red and Yellow Soils. U. S. Dept. Agr., Div. Soil Survey, Lincoln, Nebr., Mar. 17, 1948.

In this county the red members of the Red-Yellow Podzolic group belong to the following series:

Baxter	Armour
Cookeville	Etowah
Talbott	Nolichucky
Swaim	Waynesboro

Baxter series.—The Baxter soils have developed from cherty limestone residuum on the gentle to strong slopes of dissected uplands. These soils are highly leached, strongly acid, and mostly low to very low in fertility. They have a well-developed profile, but profile development has been impeded by the high content of unsoluble material, particularly silica, which occurs chiefly as chert. The depth to bedrock and permeability of these soils increase with an increase in chert, but cohesiveness, erosiveness, and content of plant nutrients decrease. A profile of Baxter cherty silt loam, sloping phase, is described in the subsection, Descriptions of Soils.

Cookeville series.—The soils of the Cookeville series have developed from the residuum of moderately high grade limestone that is less siliceous or cherty than the residuum from which the Baxter soils developed. The eluviated (A_1) horizon is darker in color than that of the Baxter soils. The Cookeville soils are well drained, relatively thick over bedrock, and gently sloping to strongly sloping. They generally are on more nearly level relief than the Baxter soils. They have developed in climate similar to that of other soils in the county, but the vegetation, especially the ground cover, is relatively dense. The surface soil, or A horizon, is permeable to water and relatively thoroughly leached. The soils are medium to strongly acid. A profile of Cookeville silt loam, gently sloping phase, is described in the subsection, Descriptions of Soils.

Talbott series.—The only Talbott soil mapped in Coffee County is Talbott cherty silty clay loam, severely eroded strongly sloping phase. A profile of this soil is described in the subsection, Descriptions of Soils. Talbott soils have developed from residuum of argillaceous limestone. The high clay content and very firm consistence of the B and C horizons are related to the clay content of the parent material. The Talbott soil of Coffee County has a higher chert content and a greater depth to bedrock than is typical of Talbott soils of other areas. This soil is similar to Mimosa and Swaim soils in many characteristics. It resembles the Baxter soils in chert content and in relief, or position, but it has a browner surface soil and redder B and C horizons, which are more clayey and have firmer consistence. The soil is strongly acid.

Swaim series.—The Swaim soils have developed from old colluvium and local alluvium. These materials have washed from soils derived from argillaceous limestone. Swaim soils are similar to the Talbott and Mimosa soils in texture, consistence, and permeability, but their profile is less well developed. In depth to limestone bedrock, they range from 24 to 84 inches and are distinctly mottled below a depth of 30 inches. They are medium to strongly acid. A profile of Swaim silty clay loam, eroded gently sloping phase, is given in the subsection, Descriptions of Soils.

Armour series.—The Armour series consists of Red-Yellow Podzolic soils that have some characteristics of Reddish-Brown Lateritic soil. These soils occur on low and medium-high stream terraces and on foot slopes. They have formed from old general alluvium or from local alluvium washed from limestone that is mainly phosphatic. They have strongly developed profiles, but the degree of development varies from place to place, mainly because of the different length of time the materials have been in place. Partly because these soils have a medium to high amount of plant nutrients and good moisture relations, the growth of the native mixed deciduous forest was dense. Originally the A horizon contained a large amount of organic matter. The relief ranges from gently sloping to sloping. The reaction is slightly to strongly acid. A profile of Armour silt loam, eroded gently sloping phase, is described in the subsection, Descriptions of Soils.

Etowah series.—The Etowah series consists of Red-Yellow Podzolic soils that have some characteristics of Reddish-Brown Lateritic soils. These soils occur on medium-high stream terraces. They have formed from old alluvium that was derived chiefly from limestone but partly from sandstone. They are somewhat similar to Cumberland soils, but their A horizon is slightly less brown and their B horizon is lighter red, more permeable, and coarser textured. They are somewhat younger than the Cumberland soils and generally occupy lower stream terraces. In many characteristics, particularly color and texture, the older, more mature Etowah soils resemble the Cookeville soils, whereas the younger Etowah soils resemble the Hermitage soils. The Etowah soils are gently sloping to sloping. They are medium to strongly acid. Profiles of Etowah silt loam, eroded gently sloping phase, and Etowah silt loam, eroded gently sloping phosphatic phase, are described in the subsection, Descriptions of Soils.

Nolichucky series.—The Nolichucky soils have formed on high stream terraces from old alluvium that originated mainly from sandstone. In most places the alluvium contains an admixture of limestone materials. These soils have developed on gently sloping to sloping relief under a mixed deciduous forest. The forest is sparse, and it has supplied the A horizon with only a moderate to very small amount of organic matter. The soils are more highly leached and lighter in color than the Waynesboro soils that developed on similar parent material. They are strongly to very strongly acid. A profile of Nolichucky loam, gently sloping phase, is described in the subsection, Descriptions of Soils.

Waynesboro series.—The Waynesboro series consists of Red-Yellow Podzolic soils that have some characteristics of Reddish-Brown Lateritic soil. They have formed on old high stream terraces in old alluvium that was derived chiefly from sandstone and partly from limestone. The B horizon of the Waynesboro soils is not so fine textured and is less firm than that of the Cumberland soils that developed in old alluvium consisting of materials derived chiefly from limestone. Partly because the substratum is pervious to water, Waynesboro soils are rather thoroughly leached. They are not, however, so highly leached as the Nolichucky soils, which are either older or were developed from more acid parent materials. Waynesboro soils occur on gentle to strong slopes. They are strongly to medium acid. A profile of Waynesboro loam, gently sloping phase, is described in the subsection, Descriptions of Soils.

The yellow members of the Red-Yellow Podzolic group belong to the following series:

Mountview	Pace
Dickson	Humphreys
Sango	Captina
Colbert	Holston
Hartsells	Monongahela

Mountview series.—The soils of the Mountview series occur on uplands. They have developed from a thin loesslike silt mantle deposited on residuum weathered from cherty limestone. The silt material was either windblown or the weathered products of a practically chert-free stratum over the cherty limestone residuum. The depth of the practically chert-free layers varies from about 14 to 30 inches. The Mountview soils generally are on slightly more sloping and dissected landscapes than the Dickson soils that developed from similar parent material. Their profile has no siltpan. These soils have gently sloping relief and are strongly to very strongly acid. Profiles of Mountview silt loam, gently sloping phase, and Mountview silt loam, gently sloping shallow phase, are described in the subsection, Descriptions of Soils.

Dickson series.—The Dickson series consists of Red-Yellow Podzolic soils that have a silty fragipan. Like the Mountview soils, the Dickson soils have formed on uplands from a silty loesslike mantle, about 3 feet thick, that overlies residuum weathered from cherty limestone. Partly because of the gentle slopes, and the moderately slow permeability of the subsoil, these soils are only moderately well drained. The natural vegetation was mixed deciduous forest, chiefly oak and hickory. The soils are strongly to very strongly acid. A profile of Dickson silt loam, gently sloping phase, is described in the subsection, Descriptions of Soils.

Sango series.—Sango silt loam is the only Sango soil mapped in Coffee County. A profile of this soil is described in the subsection, Descriptions of Soils. Sango silt loam is a Red-Yellow Podzolic soil that has a fragipan. It has developed from a loesslike silt mantle that overlies cherty limestone residuum. Typically, it is level to gently sloping. Its parent material resembles that of the Dickson soils, which developed on gentle slopes. This Sango soil differs from the Dickson soils chiefly in its lighter color and shallower depth to fragipan. The deciduous forest has a high proportion of blackjack and post oaks. This forest cover is a result rather than a cause of the differences between the soils of the Sango and Dickson series. Sango silt loam is strongly to very strongly acid.

Colbert series.—The Colbert soils are Red-Yellow Podzolic soils that have some characteristics of argipan Planosols. The term argipan is defined as a compact horizon rich in clay formed from illuviation and separated more or less abruptly from the overlying layer. The Colbert soils have formed from the residuum of weathered argillaceous limestone. They are characterized by mottled very firm clay in the lower part of the B horizon. The soils are strongly sloping to moderately steep and somewhat poorly drained to moderately well drained. They are medium acid to strongly acid. A profile of Sango silt loam is described in the subsection, Descriptions of Soils.

Hartsells series.—The Hartsells soils have developed on uplands from the residuum of acid sandstone. In places they are affected by small lenses of acid shale. They are well drained, friable, and moderately coarse textured. Because these soils are open and porous, they are highly leached. The resistance to weathering of the underlying sandstone bedrock mainly accounts for the relatively shallow depth of the soil profile, but geologic erosion has been active to some extent. These soils have gently sloping to sloping relief. They are strongly acid to very strongly acid. A profile of Hartsells fine sandy loam, gently sloping phase, is described in the subsection, Descriptions of Soils.

Pace series.—The Pace soils have formed on foot slopes, benches, and colluvial fans from accumulations of colluvium and local alluvium. These materials have drifted or washed from upland soils that were derived chiefly from cherty limestone. These soils have a firm or compact mottled layer that varies in depth and in degree of development. The upper part of these soils is highly leached. Apparently relief and the permeability of the cherty upper layers were the main influences in the development of the compact layer, although time has been important. Pace soils are gently sloping to sloping and moderately well drained. They are medium acid to strongly acid. Profiles of Pace cherty silt loam, eroded gently sloping phosphatic phase, and Pace cherty silt loam, eroded gently sloping phase, are described in the subsection, Descriptions of Soils.

Humphreys series.—The only soil of this series mapped in Coffee County is Humphreys silt loam, gently sloping phase. A profile of this soil is described in the subsection, Descriptions of Soils. Humphreys silt loam, gently sloping phase, has formed on low stream terraces. Its parent material consists of old alluvium derived from limestone. It was developed under a deciduous forest cover on gentle slopes. It is a well drained, relatively young soil that has medium profile development. Some low areas of this soil are likely to be flooded and to receive additional sediments. The soil is medium acid to strongly acid.

Captina series.—The Captina series consists of Red-Yellow Podzolic soils that have a fragipan. They occur on medium-high to low stream terraces on old alluvium. This alluvium has washed from soils underlain chiefly by limestone and in places by sandstone. Captina soils are moderately well drained. The drainage is restricted by the gentle relief and the slowly permeable underlying material. These soils are strongly acid to medium acid. A profile of Captina silt loam, gently sloping phase, is described in the subsection, Descriptions of Soils.

Holston series.—The Holston soils have developed from old alluvium on medium-high and high stream terraces. The alluvium was derived from materials weathered chiefly from sandstone but partly from limestone. Although the Holston and Nolichucky soils appear to have developed from similar parent material, the B horizon of the Holston soils is yellowish and that of the Nolichucky soils is reddish. The Holston soils are gently sloping to sloping and well drained. They have been leached considerably and are strongly acid to very strongly acid. A profile of Holston loam, gently sloping phase, is described in the subsection, Descriptions of Soils.

Monongahela series.—The Monongahela series consists of Red-Yellow Podzolic soils that have a fragipan at depths of about 24 to 30 inches. The drainage is restricted by this compact layer and the gentle relief. These moderately well drained soils are associated with the well-drained Holston and the somewhat poorly drained Tyler soils. Like these associated soils, they have developed on stream terraces from old alluvium. The alluvium was derived chiefly from sandstone but partly from limestone. These soils are strongly acid to very strongly acid. A profile of Monongahela loam, gently sloping phase, is described in the subsection, Descriptions of Soils.

Reddish-Brown Lateritic soils

Reddish-Brown Lateritic soils are zonal soils that have a dark reddish-brown granular surface soil, a red friable clay B horizon, and red or reticulately mottled lateritic parent material. These soils have developed under humid tropical climate and tropical forest vegetation (*9*). Laterization, accompanied by little or no podzolization, has dominated in soil development.

In this county the Reddish-Brown Lateritic soils are members of the following series:

Decatur	Hermitage
Pembroke	Cumberland

Decatur series.—The Decatur soils have developed on uplands from residuum of high-grade limestone. This residuum contains little siliceous material. Aided by a fairly high amount of plant nutrients and favorable moisture, these soils supported a dense forest of mixed hardwoods. The soils are gently sloping to sloping. They are medium acid to strongly acid. A profile of Decatur silty clay loam, eroded gently sloping phase, is described in the subsection, Descriptions of Soils.

Pembroke series.—The only soil of the Pembroke series mapped in Coffee County is Pembroke silt loam, eroded gently sloping phase. A profile of this soil is described in the subsection, Descriptions of Soils. Pembroke silt loam has developed on uplands from a mantle of silty loesslike material that overlies residuum of high-grade limestone. This silty layer is about 24 to 30 inches thick. It was either windblown or derived from rock different than high-grade limestone. Aided by a fairly high amount of plant nutrients and favorable moisture, this soil supported a dense forest of mixed hardwoods. The soil is gently sloping and well drained. It is medium acid to strongly acid.

Hermitage series.—The Hermitage soils have developed on foot slopes and benches from old colluvium and local alluvium that have washed and drifted from uplands underlain mainly by high-grade limestone. These soils have a well-developed profile, although the degree of development varies with the length of time the soil material has been in place. Aided by a fairly high content of plant nutrients and favorable moisture, these soils supported a dense mixed deciduous forest. The soils are gently sloping to sloping and well drained. They are generally medium acid, but the reaction ranges from medium acid to strongly acid. A profile of Hermitage silt loam, eroded gently sloping phase, is described in the subsection, Descriptions of Soils.

Cumberland series.—The Cumberland soils have developed on high stream terraces from old alluvium that was derived mostly from limestone but partly from sandstone. These soils have relatively high fertility and favorable moisture content. A dense forest has given a moderate to high amount of organic matter to the upper layers. The Cumberland soils are similar to the Decatur soils, but in most areas they are deeper and more friable. In places they have variable quantities of sand and gravel throughout the profile. These soils are gently sloping to sloping and well drained. They are medium acid to strongly acid. A profile of Cumberland silt loam, eroded gently sloping phase, is described in the subsection, Descriptions of Soils.

Gray-Brown Podzolic soils

Gray-Brown Podzolic soils are zonal soils that have a comparatively thin organic covering and organic-mineral layers over a grayish-brown leached A horizon that overlies an illuvial B horizon. These soils have developed under deciduous forest in a temperate moist climate. They have a surface covering of leaf litter, which was deposited mostly by deciduous trees. A dark, thin, slightly or moderately acid humus is somewhat mixed with the mineral soil. A grayish-brown, crumb-structured loamy A_1 horizon overlies a moderately fine textured, blocky yellowish-brown, brown, brownish-yellow, or reddish-brown B horizon that is lighter colored with increasing depth. The total depth of the solum varies considerably but seldom exceeds 4 feet (*9*). Podzolization is the chief process in the development of these soils (*9*). These soils have developed in a climate similar to that of the Gray-Brown Podzolic and Red-Yellow Podzolic soil regions. Apparently such factors as parent material, relief, and time have been of primary importance in determining the differences in these soils that exist.

In this county the Gray-Brown Podzolic soils are members of the following series:

Mimosa	Sequatchie
Dellrose	Whitwell

Mimosa series.—The Mimosa soils have developed on uplands from weathered products of argillaceous limestone high in phosphorus. This parent rock partly accounts for the firm to very firm consistence and the fine or moderately fine texture of the B and C horizons. Because of the heavy clay of the B and C horizons, these soils have slow but adequate internal drainage. They are gently sloping to strongly sloping and are moderately to very highly erodible under cultivation. The moderate depth to bedrock in some areas may have been partly the result of erosion under native vegetation. This vegetation had a large proportion of oak, hickory, poplar, locust, and walnut. The vegetation and the phosphorus of the parent material account, in part, for the dark-brown to brown color of the A horizon. These soils are medium to strongly acid. Profiles of Mimosa silty clay loam, eroded sloping phase; Mimosa cherty silt loam, eroded sloping phase; and Mimosa, Baxter, and Colbert very rocky soils, are described in the subsection, Descriptions of Soils.

Dellrose series.—The Dellrose series consists of Gray-Brown Podzolic soils that have some characteristics of Lithosols. The Dellrose soils have formed from old colluvium and alluvium on strongly sloping to steep foot slopes. This alluvium was derived chiefly from cherty limestone. The degree of profile development is generally weak, but it varies somewhat from place to place, chiefly because of the length of time the parent material has been in place. These soils are medium acid to strongly acid. A profile of Dellrose cherty silt loam, moderately steep phase, is described in the subsection, Descriptions of Soils.

Sequatchie series.—The Sequatchie series consists of Gray-Brown Podzolic soils that have some characteristics of Alluvial soils. The Sequatchie soils occur on the low stream terraces along the larger creeks and the rivers. They have developed in old alluvium that was derived chiefly from sandstone but partly from limestone. Although these soils are sandy and porous, they are not highly leached. The relief is mostly level to gently sloping, but a small part is sloping. These soils are well drained. They are slightly acid to strongly acid. A profile of Sequatchie fine sandy loam, gently sloping phase, is described in the subsection, Descriptions of Soils.

Whitwell series.—The Whitwell series consists of Gray-Brown Podzolic soils that have some characteristics of Low-Humic Gleys. These soils have developed on low stream terraces from alluvium that was washed from soils underlain chiefly by sandstone but partly by limestone. Partly because of the slowly permeable substratum and partly because the water table is alternately high and low, the Whitwell soils have slow to medium internal drainage. These soils are level to gently sloping, and runoff is slow to very slow. Many areas are likely to be flooded and to have additional sediment deposited. These soils are medium acid to strongly acid. A profile of Whitwell loam, gently sloping phase, is described in the subsection, Descriptions of Soils.

Planosols

Planosols are intrazonal soils that have eluviated surface horizons underlain by B horizons that are more strongly illuviated, cemented, or compacted than those of associated normal soils. They have developed on nearly flat uplands under grasses or trees in a humid or subhumid climate (*9*). Podzolization and gleization are the soil forming processes that account for the development of Planosols. Distinguishing these soils is a well-defined layer or cemented material that occurs at varying depths. This layer is ordinarily bluish gray or olive gray, sticky, compacted, and often structureless. It has developed where drainage is restricted.

In Coffee County most of the Planosols have a siltpan at a depth of about 2 feet. These soils are moderately well drained to poorly drained. The siltpan is not a zone of high clay concentration; the clay content appears to be rather low. The material generally is compacted rather than cemented, but in places there is some silica cementation. The siltpans are called fragipans, which are very compact horizons, rich in silt, sand, or both, and usually relatively low in clay (*11*).

Planosols have developed under a climate similar to that under which the zonal soils developed, but internally Planosols are more moist and less well aerated than zonal soils. Both Planosols and zonal soils have developed under deciduous forest, but the composition of the forest probably differed. The thicker and more compact siltpans generally occur on the less permeable underlying materials. In this county, soils that have a siltpan have formed from parent material that is generally high in silt and very fine sand and low in clay and coarse sand.

Planosols in this county are members of the following series:

Guthrie	Taft
Lawrence	Purdy
Robertsville	Tyler

Guthrie series.—The Guthrie soils have formed on flats or in depressions from a thin loesslike silt mantle that overlies cherty limestone residuum. The surface runoff is very slow; internal drainage is very slow to slow. The depth to the fragipan and the development of the fragipan are highly variable because of the differences in the local relief, the permeability of the substratum, and the length of time the soil material has been in place. In many places the soils have formed from slope wash or creep. The fragipan varies in texture from heavy silt loam to silty clay. The properties of this layer are believed to be mainly the result of differences in the parent material rather than of the soil-forming processes. The mixed deciduous forest consists of trees that tolerate poor drainage. The soils are strongly to very strongly acid. A profile of Guthrie silt loam is described in the subsection, Descriptions of Soils.

Lawrence series.—The only soil of the Lawrence series mapped in Coffee County is Lawrence silt loam. A profile of this soil is described in the subsection, Descriptions of Soils. Lawrence silt loam is a Planosol that has some of the characteristics of Red-Yellow Podzolic soils. It occurs in uplands and is somewhat poorly drained. It has developed from a loesslike silt mantle that overlies cherty limestone. Its parent material is similar to that of the Dickson, Sango, and Guthrie soils. The differences between Lawrence silt loam and the Dickson, Sango, and Guthrie soils are related to differences in drainage. The Lawrence soil has formed under a deciduous forest, the dominant trees of which were tolerant of poor drainage. The relief is mostly level but ranges from level to gently sloping. Surface runoff is very slow to slow; internal drainage is slow. This soil is strongly acid to very strongly acid.

Robertsville series.—The Robertsville soils occur on high and low stream terraces. Like the Guthrie and Purdy soils, they are in flats and depressions, are poorly drained and light colored, and have a compact layer below the subsoil. They have developed from old alluvium derived mainly from limestone but partly from sandstone. This alluvium is similar to the parent material of the Captina and Taft soils. The Robertsville soils have very slow surface runoff and internal drainage. They differ from the Taft soils mainly because of their poorer drainage. The Robertsville soils are strongly to very strongly acid. A profile of Robertsville silt loam, is described in the subsection, Descriptions of Soils.

Taft series.—The Taft soils are Planosols that have some characteristics of Red-Yellow Podzolic soils. They have formed on flats and gentle slopes on low and high stream terraces. They have developed from old alluvium consisting of materials that were derived mainly from limestone but partly from sandstone. The Taft soils are somewhat poorly drained. They have profile characteristics intermediate between those of the Captina soils and the Robertsville soils. Both surface runoff and internal drainage are slow; apparently the soils developed under these drainage conditions. These soils are strongly acid to very strongly acid. Profiles of Taft silt loam, and Taft silt loam, overwash phase, are described in the subsection, Descriptions of Soils.

Purdy series.—The Purdy soils occur in flats and depressions on high stream terraces. They have developed from acid sandstone residuum that contained an admixture of limestone residuum. They are associated with the Monongahela and Tyler soils, which developed from similar parent material. Purdy soils are more poorly drained than the Tyler soils and somewhat finer textured in the lower parts of the profile. Like the Tyler soils, they are highly leached, are low in organic matter, and have a similar fragipan. Surface runoff is very slow to ponded; internal drainage is very slow. These soils are very strongly acid to strongly acid. A profile of Purdy loam is described in the subsection, Descriptions of Soils.

Tyler series.—The Tyler soils are Planosols that have characteristics of Red-Yellow Podzolic soils. These soils have formed on the nearly level to depressed parts of high to low stream terraces. They have developed from old alluvium similar to the parent materials of the Holston, Monongahela, and Purdy soils. This alluvium was derived chiefly from sandstone but partly from limestone. Tyler soils have characteristics intermediate between those of the Monongahela soils and the Purdy soils. They are poorly drained; surface runoff and internal drainage are very slow. This poor drainage is partly the result of the relief and partly the result of the permeability of the substratum. A fragipan occurs at depths of 18 inches or more. These soils are strongly acid to very strongly acid. Profiles of Tyler loam and Tyler loam, overwash phase, are described in the subsection, Descriptions of Soils.

Low-Humic Gley soils

Low-Humic Gley soils are in the intrazonal great soil group. They have developed through gleization under imperfect to poor drainage. These soils have a very thin surface horizon that is moderately high in organic matter. This horizon underlies a mottled gray and brown gleylike mineral horizon (*8*). The Low-Humic Gley soils in Coffee County are of the Lee and Prader series.

Lee series.—The only soil of the Lee series that is mapped in Coffee County is Lee silt loam. A profile of this soil is described in the subsection, Descriptions of Soils. Lee silt loam occurs on first bottoms where it has developed from recent alluvium that was washed from soils underlain chiefly by low-grade limestone. It is mainly grayish in the upper part of the solum and prominently mottled in the lower part. It is poorly drained; the mottling indicates that it is waterlogged most of the time. This soil has a silt loam texture to depths of 12 to 16 inches. Below these depths, it is finer textured and more intensely mottled with increasing depth. The finer textured lower layer may be partly the result of soil-forming processes. A small part of Lee silt loam that was associated with the Huntington and Lindside soils was originally classified as a member of the Melvin series, which is not recognized in this county. The Lee soil is strongly to very strongly acid.

Prader series.—The only soil of the Prader series that is mapped in Coffee County is Prader fine sandy loam. A profile of this soil is described in the subsection, Descriptions of Soils. This soil occurs on the first bottoms, where it has formed from recent alluvium that was derived largely from sandstone residuum but partly from limestone residuum. It is poorly drained and mainly grayish with a few to many, fine, faint mottles in the upper part of the profile. In the lower part the mottles are many, fine, and distinct. In places the lower layers are finer textured than typical and consist of clay loam or sandy clay loam. The differences in the layers may be partly the result of the soil-forming processes, but in most places they are probably the result of the differences in the parent material. The Prader soil is slightly acid to strongly acid.

Humic Gley soils

Humic Gley soils are in the intrazonal great soil group. They are poorly drained to very poorly drained hydromorphic soils having moderately thick dark-colored organic-mineral horizons that are underlain by mineral gley horizons (*8*). The only Humic Gleys in the county are soils of the Dunning series.

Dunning series.—The Dunning soils occur on first bottoms where they have developed from fine-textured alluvium that was washed chiefly from soils underlain by limestone. The upper 10 to 12 inches of these soils is very dark gray or very dark grayish-brown to dark-gray heavy silt loam or silty clay loam. Next in profile and continuing to an average depth of about 30 inches, is material that is considerably finer textured than the layer above. It is very dark gray to dark gray with a few to many mottles. Below depths of 30 to 36 inches, the substratum is quite variable in color, texture, consistence, and mottling. The textural and structural differences between the layers probably are mainly inherited characteristics, but the soil-forming processes appear to have had some influence in the formation of the gleyed layers. The relief is level, and the soils are somewhat poorly drained. Their reaction ranges from neutral to slightly acid or strongly acid. Profiles of Dunning silty clay loam, drained phases; Dunning silt loam, drained overwash phase; and Dunning silt loam, silty substratum phase, are described in the subsection, Descriptions of Soils.

Regosols

Regosols are azonal soils that consist of deep unconsolidated rock (soft mineral deposits) in which few or no clearly expressed soil characteristics have developed. These soils are largely confined to recent sand dunes, and to loess and glacial drift of steeply sloping lands (*8*). In this county the Regosols were derived from the residuum of cherty limestone and are represented only by members of the Bodine series.

Bodine series.—The Bodine series consists of Regosols that have some characteristics of Red-Yellow Podzolic soils. Bodine soils occur on uplands, where they have developed from material that is residual from the weathering of level-bedded Mississippian limestone. Bodine soils have a large content of chert fragments. They occur chiefly on sloping to steep relief in the highly dissected parts of the cherty limestone areas. The slopes range from 5 to 60 percent or more, but most of them are between 20 and 45 percent. Drainage is somewhat excessive; the soils are considerably leached, strongly to very strongly acid, and low in fertility and organic matter.

Profile development has been considerably retarded by the highly resistant parent material and the strong slope. The chert fragments that comprise 70 to 80 percent of the soil mass are highly resistant to disintegration. In some places, especially on the lower parts of long slopes, chert fragments and soil material have sloughed down and soil that is deeper than typical has accumulated.

Because of the strong relief and consequent rapid surface runoff, little water remains for plant growth. The soil material that forms is removed fairly rapidly. The parent material, therefore, does not become available fast enough or remain in place long enough for the active soil-forming agencies—climate and vegetation—to form well-developed soil profiles. Consequently, the Bodine profile is not so well developed as that of the Red-Yellow Podzolic soils. A profile of Bodine cherty silt loam, moderately steep phase, is described in the subsection, Descriptions of Soils.

Lithosols

Lithosols are azonal soils that have no clearly expressed soil morphology. They consist of a freshly and imperfectly weathered mass of rock fragments and are largely confined to steeply sloping land (*9*). These soils occupy positions where geologic erosion is relatively rapid, and they generally consist of materials that are easily eroded. The material therefore is removed from the surface or is mixed to such an extent that soil-forming processes have not acted long enough to produce well-defined genetic soil profiles. As mapped, the Lithosols may include small areas of zonal soils. The only Lithosol in the county is a member of the Muskingum series.

Muskingum series.—The only Muskingum soil mapped in this county is Muskingum stony fine sandy loam, strongly sloping phase. A profile of this soil is described in the subsection, Descriptions of Soils. The soil is a Lithosol that has some characteristics of Gray–Brown Podzolic soils. It has developed on uplands from residuum of sandstone. It formed chiefly under a deciduous forest that had a scattering of pines in places. It is shallow to deep and shows little genetic morphology. Because it is sloping to strongly sloping, it is susceptible to geologic erosion. The parent rock weathers slowly, and the material does not remain in place long enough for a well-developed profile to form. This Muskingum soil is excessively drained and highly leached. It is strongly acid to very strongly acid and low in fertility and organic matter. In some of the less strongly sloping areas, a profile has formed that is similar to that of the zonal Gray-Brown Podzolic soils.

Alluvial soils

Alluvial soils are azonal soils that developed from transported and recently deposited alluvium; they are characterized by weak or no modification of the original material by soil-forming processes (*9*). In Coffee County, these soils are on first bottoms along streams, on foot slopes, along small drainageways, and in depressions in the uplands. They are nearly level or gently sloping. Their internal drainage is very rapid, medium, or slow. The main common properties of these soils are related to the lack of soil development. The alluvial soils that have similar parent material but different drainage are differentiated mainly on the basis of properties that are related to differences in drainage.

Alluvial soils in this county are members of the following series:

Greendale	Lobelville
Emory	Bruno
Huntington	Staser
Lindside	Hamblen

Greendale series.—The soils of the Greendale series occur on foot slopes and colluvial fans, in depressions, and along drainways. They have formed in recent colluvium and local alluvium that were derived from cherty limestone. Soils of the Baxter, Bodine, Mountview, and Dickson series have contributed most of the parent materials. In many places there are frequent additions of soil material from adjoining upland slopes. The Greendale soils are young and generally have indistinct or weakly developed profiles, but a weak B horizon has developed in places. The soils are level to gently sloping. They are moderately well drained to well drained, and medium acid to strongly acid. A profile of Greendale silt loam is described in the subsection, Descriptions of Soils.

Emory series.—The only Emory soil mapped in Coffee County is Emory silt loam. A profile of this soil is described in the subsection, Descriptions of Soils. The Emory soils are Alluvial soils that have some characteristics of Reddish-Brown Lateritic soils. Emory silt loam was formed from recent colluvium and local alluvium that were derived mostly from high-grade limestone. The soil, like the Greendale soils, occurs on foot slopes and colluvial fans, in depressions, and along drainageways. It has formed on level to gently sloping relief, under a deciduous forest, in a climate similar to that under which its associated zonal soils were formed. The parent materials were so recently deposited that soil-forming processes have not had time to act and no genetic profile has developed. Emory silt loam is well drained and medium acid to slightly acid.

Huntington series.—The Huntington soils occur on first bottoms in recent alluvium that was washed from uplands underlain mainly by phosphatic limestone. These soils were formed under a deciduous forest. They are generally higher in bases, phosphorus, nitrogen, and organic matter than their associated zonal soils of the uplands. The Huntington soils are brownish and are well drained to depths of 24 inches or more. The upper part of the soils is generally silt loam to depths of 8 to 14 inches. The lower part is silt loam, silty clay loam, sandy loam, or material of other texture. Where the lower part is a silty clay loam, the differences between the layers may be partly the result of soil-forming processes, but probably these differences are the result of differences in the deposits. The soils are level to gently sloping and are slightly acid to neutral. Profiles of Huntington silt loam, phosphatic phase, and Huntington cherty silt loam, local alluvium phosphatic phase, are described in the subsection, Descriptions of Soils.

Lindside series.—The Lindside soils are Alluvial soils that have subsoils somewhat similar to those of Low-Humic Gleys. These soils have formed on first bottoms from alluvium that was derived mainly from phosphatic limestone. They generally are the poorer drained of the moderately well drained soils and the better drained of the somewhat poorly drained soils. Generally the soils are brownish friable silt loam to depths of 10 to 18 inches. Below this the material is slightly finer in texture; it becomes more intensely mottled with increasing depth. The mottling indicates that the lower part of the soils remains waterlogged much of the time. Included with the Lindside soils are some areas that were formerly classified as Egam soils. These areas apparently have a higher degree of morphologic development, although the differences could be the result of differences in parent material. The Lindside soils are slightly acid to neutral. Profiles of Lindside silt loam, phosphatic phase, and Lindside silt loam, local alluvium phase, are described in the subsection, Descriptions of Soils.

Lobelville series.—The Lobelville soils have developed on the nearly level flood plains in young alluvium that was washed from upland soils underlain chiefly by low-grade limestone. These soils have a mottled surface soil of grayish-brown or dark-grayish brown friable silt loam. There is no B horizon. The C horizon is friable silt loam or light silty clay that becomes more distinctly mottled with increasing depth. The native vegetation is water-tolerant hickory, oak, maple, sycamore, ash, willow, gum, beech, and alder. The soils are strongly acid. A profile of Lobelville silt loam is described in the subsection, Descriptions of Soils.

Bruno series.—The only soil of the Bruno series mapped in Coffee County is Bruno loamy fine sand. A profile of this soil is described in the subsection, Descriptions of Soils. Bruno loamy fine sand occurs on level to gently sloping first bottoms on alluvium derived from soils on the uplands underlain mainly by sandstone. This soil is excessively drained. It occurs adjacent to streams and overflow channels and contains a large amount of sandy sediments. These coarse materials apparently have been influenced by limestone, because the soil is medium to slightly acid.

Staser series.—The Staser soils occur on level to gently sloping first bottoms on recent alluvium that was derived mainly from sandstone but partly from limestone. These soils are well drained. The surface soil is dark-brown or brown fine sandy loam. The underlying layer to depths of 24 to 36 inches is brown or yellowish brown. It is similar to the surface soil or slightly coarser textured. The profile is free of mottling to depths of 24 inches or more. These soils are neutral or slightly acid to strongly acid. A profile of Staser fine sandy loam is described in the subsection, Descriptions of Soils.

Hamblen series.—The Hamblen series consists of Alluvial soils that have a subsoil that has some of the characteristics of the subsoil of Low-Humic Gleys. These soils occur on level first bottoms. The parent material is recent alluvium that was derived from sandstone but that contains an admixture of materials derived from limestone. The Hamblen soils are somewhat poorly drained to moderately well drained. They are the more poorly drained of the moderately well drained soils and the better drained of the somewhat poorly drained soils. Hamblen soils are dark grayish brown, dark brown, or brown in the upper part. Below this and continuing to a depth of about 24 inches, the profile is brown or yellowish brown and shows some mottling. The underlying material is distinctly mottled with gray, yellowish brown, and brownish yellow. The slight textural differences among the profile layers are probably the result of the way the materials were deposited. The Hamblen soils are medium acid to neutral. A profile of Hamblen fine sandy loam is described in the subsection, Descriptions of Soils.

Agriculture

The first farming in Coffee County was in the fertile bottom lands and on terraces of the Central Basin and Highland Rim sections where the farmers grew crops for their own use. The main crops were corn and wheat. Cotton, vegetables, and other crops were also grown. Most farmers raised a few cattle and hogs; some kept small flocks of sheep. Agriculture became more diversified after the Civil War when markets were extended and farming methods improved. In recent years much of the barrens section of the county has been cleared and farmed. Yields on some farms compare with those on naturally productive soils. Farming is now the chief enterprise in Coffee County.

Land Use and Type and Size of Farms

Land in farms amounted to 184,069 acres, or 66.1 percent of the county, in 1954. The rest was largely in forest, urban and industrial areas, and military reservation. A total of 99,967 acres, or 54.3 percent of the land in farms was cropland; 42,335 acres, or 23.0 percent was woodland not pastured; and 34,543, or 18.8 percent was woodland and other land pastured. All other land in farms totaled 7,215 acres, or 3.9 percent.

In 1954 the farms of Coffee County were grouped by type as follows:

Type of farm:	*Number*
Dairy	400
Livestock other than dairy and poultry	217
General	217
Primarily crop	61
Primarily livestock	31
Crop and livestock	125
Field crop other than fruit and nut	160
Cash grain	60
Cotton	65
Other field crop	35
Fruit and nut	(1)
Poultry	5
Miscellaneous and unclassified	690

[1] Not reported.

The 1954 census classifies the farms of Coffee County by size and acreage as follows:

Size of farms (acres):	*Number*	*Acreage*
Under 10	100	494
10 to 29	225	4, 149
30 to 49	213	8, 141
50 to 69	212	12, 360
70 to 99	280	23, 179
100 to 139	243	28, 069
140 to 179	149	23, 622
180 to 219	99	19, 414
220 to 259	43	10, 234
260 to 499	112	37, 459
500 to 999	18	11, 517
1,000 and over	4	5, 422

Farm Tenure

In 1954, full owners operated 1,122 farms, part owners 305 farms, managers 1 farm, and tenants 270 farms. The proportion of tenancy decreased from 39.5 percent in 1940 to 15.9 percent in 1954. Of the 270 tenants in 1954, 18 were cash tenants, 6 were share-cash tenants, 119 were share tenants, 97 were croppers, and 30 were other and unspecified tenants.

The share tenant ordinarily furnishes his own power, machinery, and labor. The cost of seed and fertilizer is generally shared by the landlord and tenant, according to their share of the crop. If the tenant is growing corn and furnishes the power, equipment, and two-thirds of the fertilizer and seed, he gets two-thirds of the crop and the landlord receives one-third. If the landlord furnishes the power, equipment, and two-thirds of the fertilizer and seed, the landlord gets two-thirds of the crop. The same agreement applies to the growing of small grains, crimson clover, and vetch. If tobacco, cotton, or potatoes are grown and the landlord furnishes the power and equipment and one-half of the seed and fertilizer, he receives one-half of the crop. If the tenant furnishes the power, labor, equipment, and one-half of the seed and fertilizer, he receives three-fourths of the crop.

Cash tenants furnish everything and receive all income from the land rented, less the rent. The rent varies from year to year, according to the kind of farm and the prices of farm products.

The sharecropper furnishes only his labor and receives in return a share of the crop, usually one-third or one-half of the crop he works. On most farms the cropper is furnished a house, garden, and pasture for a milk cow. The contracts between the tenants and owners generally are verbal and made on a year-to-year basis. The contracts usually begin before planting and end after the crops are harvested and sold.

Crops

Corn, small grains, and hay are the leading crops grown for home use. Potatoes, cotton, and soybeans are important cash crops. The acreage of the principal crops and number of fruit and nut trees and grapevines are given for stated years in table 4.

Corn.—Corn, the most extensive crop, is grown on nearly all farms. It is grown on almost all of the soils commonly tilled, although its proportion to other crops varies in different sections. In the Central Basin areas, most of the corn is grown on the alluvial and colluvial lands and ridgetops. On the Highland Rim, the crop is grown on nearly all soils. Most farmers use fertilizers, but generally in small amounts. Most corn is fed to livestock on the farm. Some is used in local mills, and a small part is marketed.

TABLE 4.—*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*
Corn for all purposes	34, 327	32, 794	28, 750	27, 033
Small grains threshed or combined:				
Wheat	4, 127	2, 966	3, 113	3, 136
Oats	110	502	1, 430	3, 673
Barley	21	204	727	2, 073
Rye	1, 025	1, 366	1, 130	1, 516
Soybeans for all purposes	5, 142	5, 534	7, 803	7, 849
Alfalfa cut for hay or for dehydrating	200	694	2, 002	1, 291
Lespedeza cut for hay	(1)	10, 962	9, 373	9, 222
Clover and timothy cut for hay	2, 166	951	739	1, 017
Lespedeza seed harvested	(1)	1, 164	649	450
Crimson clover seed harvested	(1)	1, 203	4, 061	2, 712
Cotton	1, 260	2, 515	1, 897	1, 541
Tobacco	517	151	68	55
Irish potatoes	378	1, 146	[2] 1, 972	[3] 616
	Number [4]	*Number* [4]	*Number* [4]	*Number*
Apple trees	25, 682	19, 545	13, 137	4, 111
Peach trees	15, 584	13, 738	7, 431	2, 020
Pear trees	1, 291	1, 078	777	228
Cherry trees	1, 176	1, 691	927	161
Plum and prune trees	2, 533	1, 269	440	145
Pecan trees	36	50	88	61
Grapevines	3, 448	3, 244	3, 305	1, 183

[1] Not reported.
[2] Does not include acres for farms with less than 15 bushels harvested.
[3] Does not include acres for farms with less than 20 bushels harvested.
[4] Number in census year, which is 1 year later than year given at head of column.

Small grains.—Wheat is the most important small grain. Few farms grow more than 15 acres; consequently wheat is grown on the more productive soils. Relatively high yields are not uncommon, but the average yield for the county is probably not more than 18 bushels per acre. The wheat is harvested by combines. Complete fertilizers are used in varying amounts. Part of the wheat is used on the farm for feed. Local feed and flour mills handle most of the marketed wheat.

The acreage of oats, rye, and barley has increased in recent years because of an increased use for winter cover, pasture, and grain. These crops are commonly grown with crimson clover or vetch when these legumes are to be used for pasture or as a green-manure crop. Oats yield generally about the same or slightly less than corn on most soils, and barley yields about the same as wheat. Local feed mills handle most of the marketed grain. Buckwheat, which has never been an important crop, is used mostly for hog feed.

Soybeans.—The acreage of soybeans grown for all purposes increased from 5,142 acres in 1929 to 7,849 acres in 1954. Soybeans can be successfully grown on a number of poorly and somewhat poorly drained soils that are not suitable for corn and cotton. Soybeans are grown in all sections of the county on a wide variety of soils.

Hay and silage.—Lespedeza and alfalfa are the leading hay crops. Lespedeza is grown throughout the county because its soil and drainage requirements are not exacting. Alfalfa is grown principally on the more fertile and better drained soils of the Highland Rim and Central Basin sections. Soybeans and sericea lespedeza are less important hay crops. In 1954 the total hay acreage was 14,445 acres. Excessive pasture growth in the spring and early summer furnishes some hay and silage. Corn, or a combination of corn and sorghum, is the principal silage crop.

Cotton.—Cotton is one of the leading cash crops, but in recent years its acreage has declined. This decline is the result of acreage control and the scarcity of farm labor. Few farmers grow more than 5 to 10 acres of cotton. Yields are generally about one bale (500 pounds) an acre, and yields of 1½ bales an acre are not uncommon. Complete fertilizers are almost always used. All picking is done by hand. Most of the cotton is ginned by the two local cotton gins.

Potatoes.—Potatoes have been the leading cash crop for a number of years, but in very recent years a number of farmers have decreased their potato acreage because of unfavorable prices and yields. Most potatoes are grown on the more friable soils, particularly near Hillsboro on the Cumberland, Waynesboro, and Sequatchie soils. Potatoes are heavily fertilized and manured, since it is customary to prepare the soil in this manner for the alfalfa that follows. Most of the potatoes are marketed at Hillsboro and shipped to be used mainly for potato chips. The most common variety grown is Cobbler.

Minor crops.—Sweetpotatoes are grown for home use. Nearly all other vegetables grown are used locally. In

Figure 10.—Sweet peppers in foreground and corn in background on Holston loam, eroded gently sloping phase.

recent years the acreage of sweet peppers grown as a cash crop has increased. A local plant processes pimento peppers. Most of the peppers are grown on the Mountview, Dickson, and Holston soils on the Highland Rim (fig. 10). Burley tobacco is a minor cash crop. It was grown on a total of 54 acres in 1954. A small amount of sorghum is grown and made into sirup, chiefly for home use and local markets. Grain sorghum has been increasing in acreage in recent years, although the acreage has never been large. The amount of seed from crimson clover, lespedeza, grass, and other field seed crops sold in 1954 was much less than that sold in 1949.

Fruits.—Apples, peaches, pears, grapes, and plums are the most common fruits, but some strawberries and other small fruits are grown. Fruits not used at home are sold locally. One large nursery grows ornamental trees and fruit trees (fig. 11).

Figure 11.—Nursery stock on an area of Pembroke silt loam, eroded gently sloping phase, that has a W-type waterway, terraces, and contoured rows.

Pasture

Pastures, which are grown on many kinds of soils, vary greatly in quality and carrying capacity. According to the 1954 census, there were 28,854 acres of cropland pasture, 17,300 acres of woodland pasture, and 17,243 acres of other pasture. Much of the permanent pasture is on nonplowable land or soils otherwise not suited to crops. Most of this pasture is unimproved. Much of the cleared areas of poorly drained soils and soils likely to be flooded are used for pasture. Most pastures are poorly managed, but some pastures are excellent.

The grazing season extends from about March 15 to December 1. The pasture plants most commonly grown are orchardgrass, tall meadow fescue, Ladino clover, white clover, red clover, bluegrass, and lespedeza. Some sudangrass and millet are grown on many dairy farms for supplementary summer pasture. Small grains and crimson clover are commonly grazed in the winter months.

Livestock and Livestock Products

Cattle, hogs, sheep, horses, mules, and chickens are the main livestock in Coffee County. In 1954, a total of 8,876 cattle and calves were sold alive on 1,214 farms; 15,099 hogs and pigs on 860 farms; 1,994 sheep and lambs on 97 farms; and 151 horses and mules on 68 farms. In 1954, a total of 14,641 chickens were sold on 393 farms and a total of 244,693 dozens of chicken eggs were sold on 986 farms. In the same year dairy products were sold on 775 farms. Cows milked on the day preceding the census enumeration were 5,794 on 1,337 farms.

The number of livestock on farms of the county is given in table 5.

TABLE 5.—*Number of livestock on farms in stated years*

Livestock	1930	1940	1950	1954
	Number	*Number*	*Number*	*Number*
Horses and colts	2, 201	[1] 2, 376	1, 862	701
Mules and mule colts	2, 835	[1] 2, 805	2, 120	1, 300
Cattle and calves	10, 524	[1] 10, 708	16, 132	21, 469
Hogs and pigs	9, 827	[2] 11, 026	19, 624	14, 723
Sheep and lambs	6, 730	[3] 4, 493	3, 737	3, 018
Chickens	[1] 92, 202	[2] 88, 293	[2] 93, 369	[2] 89, 038

[1] More than 3 months old Apr. 1.
[2] More than 4 months old Apr. 1.
[3] More than 6 months old Apr. 1.

Forest Products

The production of forest products is small in Coffee County. Firewood, fuelwood, fence posts, saw logs, and veneer logs were cut on more farms than pulpwood, piling, and poles. In 1954, 6,270 cords (4x4x8 feet) of firewood and fuelwood were cut on 777 farms of the county; 37,007 fence posts were cut on 328 farms; 1,272 thousands of board feet of saw logs and veneer logs were cut on 180 farms.

General Character of the Area

Physiography, Relief, and Drainage

Coffee County lies in the Cumberland Plateau section of the Appalachian Plateau province and the Highland Rim and Central Basin sections of the Interior Low Plateau province (*3*). The entire county is underlain by sedimentary rocks ranging from the basal Pennsylvanian age down to the upper Ordovician (*4*). Throughout most of the county, the rock strata deviate only slightly from the horizontal.

The Cumberland Plateau and Cumberland Escarpment occupy about 3.2 percent of the county area. The Cumberland Plateau is about 800 to 1,000 feet above the neighboring Highland Rim and about 2,000 feet above sea level. This plateau is a true peneplain that has an undulating surface dissected by young valleys. The depths of the valleys increase toward the edges of the plateau (*3*). In Coffee County the Cumberland Plateau is capped by Sewanee conglomerate, except on a few projecting ridges and other places where the conglomerate has been removed by erosion. This conglomerate consists of a soft, massive, cross-bedded sandstone containing numerous quartz pebbles (*7*).

The Cumberland Plateau is drained mainly toward the south through creeks that flow into the Elk River. A small part of the extreme northeastern part of the county is drained toward the north into tributaries of the Cumberland River. The plateau has a well-defined dendritic drainage pattern, but a few slightly depressed areas occur on the broader remnants of the plateau. Along the larger drainageways a very few small nearly level areas are poorly drained. Hartsells and Muskingum soils are the only soils mapped on the plateau in this county. They have developed chiefly from materials weathered from the Sewanee conglomerate.

The Cumberland Plateau is separated from the Highland Rim by a very pronounced escarpment. The cliffs of this escarpment are made up of the Warren Point sandstone member of the Gizzard formation, which is the basal formation of the Pennsylvanian series. In many places the scarp drops 800 feet in a distance of one-half mile; the upper part is almost vertical. Rocks of the Mississippian series extend up the escarpment almost to the top. These rocks consist largely of argillaceous Bangor limestone. A small part is cherty, and there are a few narrow seams of shale and small remnants of sandstone.

Several of the larger streams have cut ravines or deep valleys into the plateau. Lusk Cove, the largest of these valleys, is 2 miles long and as much as 800 to 1,000 feet below the level of the Cumberland Plateau. On the escarpment are areas of Rockland, moderately steep.

The Highland Rim and Highland Rim Escarpment occupy roughly 87 percent of the county. On the east the Highland Rim is bounded by the Cumberland Plateau, which is nearly 1,000 feet higher than the rim. On the west the rim is bounded by the Highland Rim Escarpment, which descends into the Central Basin about 150 feet below.

The Highland Rim section has an average elevation of about 1,050 feet above sea level in Coffee County. The highest elevation is about 1,200 feet, and the lowest elevation is about 950 feet.

The relief of the Highland Rim is gently sloping to sloping, except for areas bordering the western edge, a few isolated ridges, and steeper slopes adjacent to streams. Locally, the relief ranges from level to moderately steep. The largest part of the Highland Rim consists of the Barrens. Drainage in this part is not well developed, and stream dissection is slight except where the Duck River and its tributaries flow into rough gorges.

Throughout much of the Highland Rim section the soils have developed from St. Louis and Warsaw limestones. St. Louis limestone is gray, fine grained to compact, and generally thick bedded. It weathers into a clay or cherty clay on which fertile soils have formed. The bedrock is generally covered by a thick mantle of residual clay and chert that has weathered from the soluble rock. In this area, the Warsaw limestone is generally grayish, thick bedded, and similar to the St. Louis limestone. In Coffee County, the Warsaw limestone is somewhat sandy and cherty and, in places, as thick as 100 feet. These two limestone formations are both very soluble; consequently both have fairly well developed underground drainage systems (*1*). The Decatur, Cookeville, and Pembroke soils have developed chiefly from the St. Louis limestone; they contain little chert. The cherty Baxter soils have developed from the Warsaw limestone. Sinkhole or karst topography is much more common on these formations than on other formations of the county.

Fort Payne chert constitutes the escarpment of the Highland Rim and underlies a considerable part of the Barrens. This formation ranges from a siliceous limestone to a calcareous chert that weathers into a cherty soil. The scarp of the Highland Rim has an average height of about 150 feet. Dissection is intense; short, narrow-crested ridges extend from the Highland Rim, and steep-walled, V-shaped valleys cut into it from the Central Basin below. The Bodine and Baxter soils were derived from the Fort Payne formation. These soils, particularly the Bodine, are shallow, cherty, and generally unproductive.

A silt mantle occurs over most of the Highland Rim (fig. 12). This mantle ranges from a thin film to a layer about 30 inches thick. It is not known whether this mantle is remnants of windblown material or residuum from rock that is different than that described. This silt mantle is much more extensive in the barrens part of the Highland Rim than in other parts. Soils of the Mountview, Dickson, Sango, Lawrence, and Guthrie series were derived, at least in part, from this silt mantle.

Figure 12.—**Silt mantle of Mountview silt loam, gently sloping phase, overlying cherty limestone residuum.**

A terrace deposit covers a considerable part of the Highland Rim. The main body occupies about 14.4 percent of the county. It extends eastward from the central part of the Highland Rim near Ragsdale to the base of the Cumberland Escarpment and continues south to the Coffee-Franklin county line just west of Bradley Creek. Although the material is largely terrace deposits, some is old valley fill material. Some areas of these deposits are associated with the present drainage system. Other areas are remnants of terraces that apparently were deposited by streams of a former drainage system. The older terrace deposits lie 10 to 100 feet above the present stream overflow.

The terrace deposits consist of sandstone and limestone materials that are intricately associated and mixed and vary according to the mode of deposition. The Holston, Monongahela, Tyler, and Purdy soils occupy most of the northern and northwestern parts of this area. The Waynesboro and Cumberland soils occupy most of the remaining high terraces, and Sequatchie and Whitwell soils occupy positions on low terraces. Smaller areas of terrace deposits are widely scattered throughout the Highland Rim. The principal areas are along Crumpton Creek and the Duck River and in the northeastern corner of the county.

Chattanooga shale, known locally as black slate, underlies the Fort Payne chert and forms the dividing line between the Highland Rim and the Central Basin (fig. 13). It averages only about 15 feet in thickness, and is not an important rock in soil formation in this county.

The Central Basin occurs in three separate areas that extend into the Highland Rim in the western part of the county along the Duck River, Garrison Fork, Noah Fork, and McBride Branch and their tributaries. A well-defined dendritic drainage pattern has developed, stream dissection is well advanced, and drainage is good. The many streams in their rapid descent to the lowlands have carved out an intricate system of deep, V-shaped valleys and tortuous ridges having differences in elevation of 100 to 300 feet. As the streams become larger toward the west, their valleys gradually widen and the ridges become less pronounced.

The topography is gently sloping to steep. The local relief is greatly influenced by remnants of the Highland Rim. These remnants form ridges that jut into the Central Basin.

***Figure 13.*—Road cut with a 15- to 20-foot exposure. Fort Payne chert above Chattanooga shale (center) and Catheys limestone.**

Both the underlying and exposed rocks in the Central Basin are argillaceous phosphatic limestones. They are generally bluish gray and fossiliferous and belong to the Cathey formation of the Ordovician age (*4*). Much of the area is covered by alluvial and colluvial materials that range from a thin layer to a layer 20 feet or more thick. The soils derived from residual material from these phosphatic limestones are members of the Mimosa series.

Climate

Coffee County has a temperate, rainy climate. Winter is generally mild with only a few extremely cold periods. Summer is hot. The average precipitation is about 54 inches, of which snow is only a small part. Summer and fall are comparatively dry. The difference between average summer and winter temperature is only 34° F. The climate of the Cumberland Plateau section of the county is slightly different from that of the rest of the county. Table 6 gives the normal monthly, seasonal, and annual temperatures and precipitation at the Weather Bureau station at Tullahoma.

TABLE 6.—*Temperature and precipitation at Tullahoma Station, Coffee County, Tennessee*

[Elevation, 1072 feet]

Month	Temperature [1]			Precipitation [2]			
	Average	Absolute maximum	Absolute minimum	Average	Driest year (1941)	Wettest year (1923)	Average snowfall
	° F.	° F.	° F.	Inches	Inches	Inches	Inches
December	42. 2	75	−5	5. 45	3. 52	7. 28	1. 5
January	41. 1	78	−14	5. 46	3. 81	5. 99	2. 6
February	43. 3	77	−22	5. 56	1. 34	5. 10	2. 0
Winter	42. 2	78	−22	16. 47	8. 67	18. 37	6. 1
March	49. 9	87	0	6. 05	3. 95	6. 77	1. 1
April	59. 1	92	21	4. 65	4. 08	6. 30	. 1
May	66. 6	97	29	4. 03	1. 35	9. 03	(3)
Spring	58. 5	97	0	14. 73	9. 38	22. 10	1. 2
June	74. 8	102	40	3. 96	2. 72	4. 46	0
July	77. 5	106	41	4. 88	6. 56	7. 60	0
August	76. 4	104	46	3. 80	3. 71	5. 24	(3)
Summer	76. 2	106	40	12. 64	12. 99	17. 30	(3)
September	71. 8	105	27	2. 99	. 50	3. 50	0
October	60. 3	93	19	2. 96	2. 85	1. 25	(3)
November	49. 0	82	−6	4. 38	2. 37	4. 72	. 4
Fall	60. 3	105	−6	10. 33	5. 72	9. 47	. 4
Year	59. 3	106	−22	54. 17	36. 76	67. 24	7. 7

[1] Average temperature based on a 67-year record, through 1955; highest temperature based on a 63-year record and lowest temperature on a 62-year record, through 1952.

[2] Average precipitation based on a 68-year record, through 1955; wettest and driest years based on a 64-year record, in the period 1883–1955; snowfall based on a 59-year record, through 1952.

[3] Trace.

Changes of temperature in the winter are abrupt, but variations in temperature between seasons are not great. Temperatures below zero occur on an average of only once a year. July and August are the hottest months, and short hot spells occur during spring and fall. As a rule, the temperature does not exceed 95° more than 15 to 20 days a year.

Winter is generally mild and has only a few extremely cold periods. Thaws usually occur between successive cold periods. Snowfall seldom exceeds 3 or 4 inches in depth, and the snow generally melts in a day or two. The weather is usually mild enough for outside farm work. On the well-drained soils a variety of winter crops are grown with little danger of winterkilling, even though they receive no effective protection from a snow blanket. Some damage follows heaving on poorly drained and fine-textured soils and on the more severely eroded soils, mostly because the plants do not get a vigorous start before cold weather.

The average frost-free period of 190 days is long enough for the maturing of nearly all of the common field crops. Killing frost has occurred as late in spring as May 10, and as early in fall as September 27, but such frosts are rare. Occasionally, late spring frosts damage the fruit crop and early garden crops, but these frosts occur only about every 5 years. The grazing period normally extends from about March 15 to December 1, but is somewhat longer on soils that have good drainage. Some grazing of winter cover crops is practical, especially late in winter and early in spring.

The average annual rainfall of 54.17 inches is fairly well distributed throughout the year. The lightest rainfall is in summer and fall and coincides with the ripening and harvesting of crops. The greatest precipitation occurs during the winter and spring. Winter rains are usually slow drizzles and may be followed by sleet or light snow. Spring and summer rains generally are short, heavy downpours that cause much accelerated erosion on soils not protected by vegetation.

Excessive spring rains occasionally delay seedbed preparation and planting of crops. On well-drained soils of the uplands these delays do not necessarily reduce yields. On imperfectly and poorly drained soils, however, seeding may be so delayed that yields are reduced. Floods in small creek bottoms sometimes damage growing crops during spring and early summer. Heavy rains at harvestime frequently damage alfalfa, red clover, and other hay crops, especially before the early or first cuttings. During extended wet periods the harvesting of small grain is frequently delayed, and occasionally the grain is damaged.

Spring droughts are rare, but often during July and August moisture is badly needed because rainfall is slight and evaporation is excessive. Drought during summer and fall do some damage to crops and pasture, particularly those on steep slopes and on soils of low moisture-holding capacity. Crops planted in fall are frequently delayed by droughts, and the young plants are somewhat susceptible to winterkilling. These crops occasionally die at an early stage of growth because of the lack of sufficient moisture. The rainfall is normally ample and well enough distributed for the maturing of common crops, except those grown on soils having a low moisture-holding capacity or excessive runoff.

The county is in an area between two of the main storm paths that cross the eastern United States; consequently there are many comparatively gentle changes in the weather but few severe ones (*10*). The heavier storms are less intense than anywhere else in the same latitude in the eastern United States (*7*). Few are destructive. Cold winds from a northerly direction are common during winter months. Summer is usually calm and has gentle breezes. Strong winds are uncommon except early in spring.

The climate of the Cumberland Plateau differs slightly from that of the Highland Rim and Central Basin section of the county. The average winter, spring, and summer temperatures are about 1 degree lower on the Cumberland Plateau, but the fall temperatures are about the same. The average annual precipitation is 1.37 inches greater on the Cumberland Plateau than on the Highland Rim, and the average snowfall is about 2 inches greater. The Weather Bureau data indicate that the growing season is 10 days longer on the Cumberland Plateau than on the Highland Rim.

Water Supply

Almost all of the county has enough water for domestic use and for livestock. Permanent streams flow in all sections except the Cumberland Escarpment and the Cumberland Plateau. Not many streams flow in the barrens, the cherty ridges of the Highland Rim Escarpment, or in the outer part of the Central Basin. Many springs issue from the basal part of the Fort Payne formation directly above the Chattanooga shale, and from the base of the Cumberland Escarpment. The small streams from these springs generally become dry late in summer and early in fall because the water sinks in the gravelly and stony stream beds.

Wells furnish most of the water for human use. Most of the dug wells furnish enough water, even during long dry periods. These wells are generally shallow. The drilled wells are normally adequate if they have been drilled deep enough to provide an ample reserve. Wells dug by hand on the barrens of the Highland Rim are generally 20 to 35 feet deep; drilled wells are generally 65 to 90 feet deep. The wells in other parts of the county vary more in depth, but they seldom exceed 100 feet.

Farm ponds supply most of the water for livestock, especially throughout much of the Highland Rim section. Most farms on the Highland Rim Escarpment and in the outer part of the Central Basin have cherty soils that are suitable for pond construction.

Supplementary irrigation is used on two farms, but it has not been used long enough for its success to be determined. Along some rivers and large permanent creeks, irrigation is apparently feasible if crops of high-cash value are grown on adjacent soils of bottom lands, terraces, and uplands. Many of the soils along the streams are coarse textured, cherty, or gravelly and have relatively low moisture-holding capacity. Before installing any irrigation system, a careful study should be made to determine the additional income over the added cost.

Figure 14.—Well-managed hardwoods forest on Mountview silt loam, gently sloping phase.

Forest

Nearly all of the county was in deciduous forest when the first white settlers arrived. Now, about 52 percent of the county is in forest. An upland hardwoods forest type, consisting mainly of oak and hickory, covers most of the forested area (fig. 14). Less extensive areas of the blackjack-hardwoods forest type occurs on some of the poorer upland soils (fig. 15). The bottom-land hardwoods type occurs on some of the poorly drained sites. The cedar-hardwoods type is much less extensive.

The total acreage of forest in the county is about 144,560 acres. About 41 percent is in farm woodland, 44 percent in private nonfarm forest, and 15 percent in United States Government reservation forest. In 1954, 982 farms reported 42,335 acres of nonpastured forest. The average acreage of nonpastured woodland per farm is about 43 acres.

Settlement, Organization, and Population

Coffee County was organized in 1836 from parts of Franklin, Bedford, and Warren Counties. Most of the early settlers were of Scotch, Irish, English, and German ancestry. They came chiefly from North Carolina, Georgia, and Virginia.

Figure 15.—Cutover post oak forest on Sango silt loam. Tree growth is very slow on this soil, which has a strong fragipan.

In 1950 the county had a population of 23,049, of which 15,487 were classed as rural. Manchester (pop. 2,341) and Tullahoma (pop. 7,562) are the principal towns. The rural population is largely concentrated on the more productive parts of the Highland Rim. Some of the barrens section of the Highland Rim is thinly populated, particularly the north-central and south-central parts. The Central Basin is about as thickly populated as the more productive parts of the Highland Rim. The Cumberland Escarpment and the Cumberland Plateau are not inhabited.

Industries, Transportation, and Markets

Although most of the people of Coffee County are engaged in farming and closely related activities, industries are important. The principal industries are shoe, garment, and sporting-goods factories and the United States Air Force Arnold Engineering Development Center for aircraft research. Other but less important industries include a cannery, a dairy-processing plant, a furniture factory, two rock quarries, three feed and flour mills, and several small sawmills. In 1954, 862 farm operators reported employment off their farms. Of these operators, 441 were employed 100 days or more off the farm.

Transportation and market facilities are adequate for most needs. Manchester and Tullahoma, the main shipping points and marketing centers, are on the Nashville, Chattanooga and St. Louis Railway. Tullahoma is on the main line that runs through the southwestern part of the county, and Manchester is on the spur line that connects Sparta (White County) with the main line at Tullahoma. Summitville and Belmont are other railroad shipping points.

On the Highland Rim and in the Central Basin, transportation from farm to market is good. A United States highway crosses the county. State highways radiate from Manchester and from Tullahoma. Many secondary and graveled all-weather roads extend to all inhabited parts of the county. Most farms are on or are not far from a road.

Bus lines operate daily service through Manchester and Tullahoma. Motor freight service is also maintained over the main highways.

Feed and flour mills provide an outlet for most of the marketed grain. The main livestock markets are Nashville, in Davidson County; McMinnville in Warren County; and Decherd, in Franklin County. Pickup service is available to practically all dairy farms. Most vegetables and fruits are sold locally.

Community Facilities and Farm and Home Improvements

Most farms are near elementary and high schools or are on school-bus routes. Most rural communities have small elementary schools. Although no college is within the county, colleges and universities at Nashville, Murfreesboro, Sewanee, Chattanooga, and Cookeville are less than 75 miles away. All communities have churches. Manchester and Tullahoma each has a hospital. Rural mail routes serve all populated areas.

Of the 1,694 farms in the county reporting in 1954, 489 had telephones; 1,534 had electricity; and 608 had running water. In the same year these 1,694 farms had 254 grain combines, 71 pickup balers, 714 motortrucks, 854 tractors, and 938 automobiles.

Engineering Properties of Soils [5]

This section is included so that the soil survey information contained in this report can be more readily used for engineering purposes. Some of these purposes are:

1. Developing industrial, municipal, and recreational sites.
2. Estimating runoff and erosion characteristics.
3. Making reconnaissance surveys of soil and ground conditions for highway and airport location.
4. Locating sources of sand and gravel.
5. Obtaining information useful in the design and maintenance of highway pavements.
6. Determining the suitability of soils for cross-country movements of vehicles and construction equipment.
7. Obtaining basic information for making engineering soil maps.

However, the descriptive report and the soil boundaries, as mapped, are somewhat generalized and should be used primarily in planning more detailed field investigations to determine the in-place condition of the soil at the proposed construction site.

The ability of the engineer to estimate engineering information of soils from this report depends on his knowledge of the pedological soil classification system used by soil scientists, and on his knowledge of the physical and environmental characteristics of the soils. After observing the behavior of soils when used in foundations and in engineering structures, the engineer can develop design criteria for each soil mapped in the county.

The primary engineering properties of the soils are listed in tables 7 through 10. The information in tables 7, 8, and 9 is based primarily on soil information from other sections of this report, test data from table 10, and field observations not elsewhere recorded. Table 7 contains general engineering descriptions of groups of similar soils. Table 8 gives for selected soils additional descriptive information on soil materials. Table 9 lists features that affect highway work. Table 10 presents engineering test data for soil samples from 26 selected locations within the county. Tables 11 and 12 give descriptive information on the engineering classifications used in this report.

Certain terms in this report that are commonly used by both the engineer and the soil scientist have different meanings to each. Some of the terms used by the soil scientist are defined in the glossary. Terms most likely to cause confusion are soil, clay, silt, sand, and granular.

Engineering Descriptions

Selected characteristics significant to engineering are given in table 7 for each soil. This table has a brief description of each soil, which includes the engineering classification, and a statement on texture, parent material, and underlying material. Also included are predominant surface slope, estimated depth to seasonally high water table and depth to bedrock, and the natural drainage class.

Comparisons between depths to bedrock and water table show that in many cases the ground-water surface lies within the bedrock. This is possible within pervious sedimentary rock and cavernous limestone. Where a range in depth to bedrock is given for several members of a soil series, the depth is generally greatest for the soils with the more nearly level slopes and least for those that are most eroded or have steepest slopes.

Physical Properties

Estimated properties of typical soil materials are given in table 8. In addition to the engineering classifications, the structure, and pH, are ratings for suitability as topsoil and for the shrink-swell potential. The term "suitability as topsoil" refers to the fertility of the soil material, and the suitability of the material for covering cut or fill slopes and for growing grass. The term "shrink-swell potential" refers to the amount of volume-change the soil material undergoes according to changes in water content. Those materials that have a high shrink-swell potential are not so desirable for construction because an increase in volume when the material is wet is usually accompanied by a loss in bearing capacity.

Features Affecting Highway Engineering Work

Table 9 gives some of the features of soils that affect highway construction. Dashed lines indicate that no unusual vertical alinement problems are anticipated for the soil named.

The location of highways in areas where the soils are sloping, moderately steep, or steep, or where excavation will be necessary, may be influenced by the depth to bedrock and the kind of bedrock. The engineer should investigate how difficult it is to excavate rock, how likely slides are to occur in dipping strata, and how likely water is to seep along or through the bedrock. Furthermore, in the location of a highway, the presence of undesirable material within or slightly below the subgrade should be considered. Large chert fragments, cobbles, or boulders make grading difficult; generally stone-free materials must be placed over these rocks as capping. A layer of very plastic clay impedes internal drainage and generally has low stability when wet; in some places, this layer can be cut out during construction, but in low, flat, or poorly drained areas, the roadway should be built well above this layer by using an embankment section. Compact layers or fragipans are significant mainly because they restrict internal drainage.

The vertical placement may also depend on poor drainage. An embankment section needs to be constructed to keep the roadway stable in places where there is an occasional flooding or a seasonally high water table (within 3 feet of surface). Interceptor ditches or underdrains may be needed where there is subsurface seepage. The sliding of overlying material may be the result of seepage in the backslopes of cuts; such occurrences are most likely in Bouldery colluvial land and Dellrose soils.

Earthwork is difficult during prolonged wet periods throughout most of Coffee County; however, excavation, transportation, and compaction of the better drained,

[5] This section was prepared by John R. Sallberg, Division of Physical Research, Bureau of Public Roads, in cooperation with Soil Conservation Service. Test data in table 10 were obtained in the Soils Laboratory, Bureau of Public Roads.

coarse-grained soil materials are possible. Silty and clayey materials may absorb so much water during prolonged wet periods that they cannot be readily dried to the optimum moisture content for proper compaction.

Table 9 gives a rating of the suitability as a source of subbase material for each soil series and land type. In general, the more suitable materials consist mainly of sand or sand and gravel materials that have relatively high bearing capacities even when wet. These materials are normally found in alluvial or colluvial deposits of soil materials that were derived from sandstone or cherty limestone.

Naturally occurring materials that are suitable for use in base courses are scarce in Coffee County. Gravel for construction has been obtained from Bodine cherty silt loam and, to a lesser extent, from Dellrose cherty silt loam. Chert gravel can be used economically for secondary and county roads but generally it is not durable enough to be used on primary roads for base course material of high type. Nor is it durable enough to be used in concrete structures. Crushed limestone, which is much more satisfactory, has been quarried at several places in Rockland, moderately steep.

Soil Engineering Test Data

Soil samples from the principal soil type of each of 13 extensive soil series were tested in accordance with standard procedures (*1*) to help evaluate the soils for engineering purposes. The test data are given in table 10. Because the soil materials tested were obtained from depths less than 5 feet, generally they do not represent materials that occur in earthwork at greater depths. Table 10 contains data obtained in moisture-density tests, mechanical analyses, and plasticity tests.

In the moisture-density or compaction test, a sample of soil material is compacted several times with the same compactive effort, each time at a higher moisture content. The dry density (unit weight) of the soil material increases as the moisture content increases until the "optimum moisture content" is reached. After that, the dry density decreases with increase in moisture content. The highest dry density obtained in the compaction test is termed "maximum dry density." Moisture-density data are important in earthwork, because, as a rule, optimum stability is obtained if the soil is compacted to about maximum dry density when it is at approximately the optimum moisture content.

The results of the mechanical analysis, obtained by combined sieve and hydrometer methods, may be used to determine the relative proportions of the different size particles making up the soil sample. The clay content obtained by the hydrometer methods, which is generally used by engineers should not be used to determine soil textural classes.

The values of the liquid limit and plasticity index indicate the effect of water on the consistence of the soil material. As the moisture content of a clayey soil increases from a very dry state, the material changes from a solid to semisolid, or plastic, state. As the moisture content is further increased, the material changes from a plastic to a liquid state. The plastic limit is the moisture content at which the material passes from a solid to a plastic state. The liquid limit is the moisture content at which the material passes from a plastic to a liquid state. The plasticity index is the numerical difference between the liquid limit and plastic limit. It indicates the range of moisture content within which a soil material is in a plastic condition.

Table 10 also gives two engineering classifications for each soil sample. These classifications are based on the mechanical analysis, the liquid limit, and the plasticity index.

Engineering Soil Classification

The engineering classification of a soil material by either the A. A. S. H. O. (*1*) or the Unified (*12*) system identifies that soil material with regard to gradation of material passing the 3-inch sieve and plasticity characteristics. The classification permits the engineer to make a rapid appraisal of the soil material through association with familiar soils having the same classification. The engineering characteristics of soil groups in the A. A. S. H. O. system are shown in table 11. Those of the Unified system are shown in table 12.

Most highway engineers classify soil materials in accordance with the A. A. S. H. O. method. In this system, soil materials are classified in seven principal groups. The groups range from A–1, consisting of gravelly soils of high-bearing capacity, to A–7, consisting of clay soils having low strength when wet. Within each group, the relative engineering value of the soil material is indicated by a group index number. These range from 0 for the best materials to 20 for the poorest. The group index number is shown in parentheses following the soil group symbol.

Some engineers prefer the Unified Soil Classification System. In addition to a description of the material within each soil group, table 12 gives some recommendations regarding the use of the soil materials of each group. In this system, soil materials are identified as coarse-grained (8 classes), fine-grained (6 classes), or highly organic.

The engineering classifications of the soil samples tested are shown in the last two columns of table 10. Soil classifications shown in tables 7 and 8 were estimated from soil texture descriptions and the data in table 10.

Planning Engineering Soil Surveys

At many construction sites, major soil variations may occur within the depth of proposed excavation and several soils may occur within a short distance. The soil map and profile descriptions, as well as the engineering descriptions given in this section, should be used in planning detailed surveys of soils at construction sites. The soil survey information in this report will enable the soils engineer to concentrate on the most significant soils. A minimum of soil samples will then be needed for laboratory testing, and an adequate investigation can be made at least expense.

TABLE 7.—*Selected characteristics significant to engineering*

Symbol	Soil	Slope	Description and engineering classification of soil	Depth to seasonally high water table	Depth to bedrock	Natural drainage
	Armour silt loam:	*Percent*		*Feet*	*Feet*	
Aa[1]	Eroded gently sloping phase	2 to 5	About 4 feet of silt loam and silty clay loam (ML or CL; A–4 or A–6) soil materials over stratified cherty silty clay loam or silty clay (GC, MH, or CL; A–2, A–6, or A–7) soil material. This alluvium occurs on low and medium stream terraces and was derived from limestone.	5 or more	3 to 6 or more.	Well drained.
Ab	Eroded sloping phase	5 to 12				
	Baxter cherty silt loam:					
Ba	Gently sloping phase	2 to 5	Soil material ranges from cherty silt loam or cherty silty clay loam (GM, ML, or CL; A–4) at the surface to cherty clay (GC or CH; A–7) near bedrock, which is cherty limestone. In places, chert fragments, ½ to 6 inches in diameter, make up 25 to 50 percent of the soil mass.	10 or more	3 to 12 or more.	Well drained.
Bb[1]	Sloping phase	5 to 12				
Bc	Eroded sloping phase	5 to 12				
Bd	Strongly sloping phase	12 to 20				
Be	Eroded strongly sloping phase	12 to 20				
	Baxter cherty silty clay loam:					
Bf	Severely eroded gently sloping phase.	2 to 5				
Bg	Severely eroded sloping phase	5 to 12				
Bh	Severely eroded strongly sloping phase.	12 to 20				
	Bodine cherty silt loam:					
Bk	Sloping phase	5 to 12	Cherty silt loam and cherty silty clay loam (GM, GC, or ML; A–2 or A–4) soil materials over cherty limestone. Chert beds occur at depths of 1½ to 3 feet. Chert fragments as much as 10 inches in diameter occupy 40 percent or more of the soil mass below a depth of 9 inches.	20 or more	8 to 25 or more.	Somewhat excessively drained.
Bm	Strongly sloping phase	12 to 20				
Bn[1]	Moderately steep phase	20 to 30				
Bo	Steep phase	30+				
Bp	Bouldery colluvial land, strongly sloping phase	12 to 20	Sandstone boulders and soil material. In most places, soil material forms less than 50 percent of the soil mass. Limestone outcrops are common. Most boulders are 2 to 4 feet in diameter.	20 or more	0 to 30 or more.	Rapid runoff.
Br[1]	Bruno loamy fine sand	0 to 5	About 1 foot of loamy fine sand (SM; A–2) soil material over stratified materials that range from fine sandy loam to sand (SM or ML; A–2 or A–4). This young alluvium occurs along the bottom lands and was derived chiefly from sandstone.	0	10 or more	Excessively drained.
	Captina silt loam:					
Ca	Level phase	0 to 2	½ to 1 foot of silt loam (mainly ML; A–4) over mainly silty clay loam (ML or CL; A–4 or A–6) soil materials on medium-high and low stream terraces. This old alluvium was derived from limestone and some sandstone. A compact layer (fragipan), ½ to 2 feet thick, occurs at about 26 inches. Material underlying the fragipan may be silty clay (MH or CH; A–7). Gravel beds are common at the base of the deposit. Bedrock is limestone.	0	3½ to 10 or more.	Moderately well drained.
Cb[1]	Gently sloping phase	2 to 5				
Cc	Eroded gently sloping phase	2 to 5				
	Cookeville silt loam:					
Cd[1]	Gently sloping phase	2 to 5	3 to 6 feet of predominantly silty clay loam or silty clay (MH or CH; A–7) soil materials over cherty silty clay or clay (MH or CH; A–7) soil materials. Bedrock is limestone.	10 or more	6 to 12	Well drained.
Ce	Eroded gently sloping phase	2 to 5				
Cf	Sloping phase	5 to 12				
Cg	Eroded sloping phase	5 to 12				

See footnote at end of table.

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TABLE 7.—*Selected characteristics significant to engineering*—Continued

Symbol	Soil	Slope	Description and engineering classification of soil	Depth to seasonally high water table	Depth to bedrock	Natural drainage
		Percent		*Feet*	*Feet*	
	Cookeville silty clay loam:					
Ck	Severely eroded gently sloping phase.	2 to 5				
Cm	Severely eroded sloping phase	5 to 12				
Cn	Gullied sloping phase	5 to 12				
Ch, Co	Severely eroded strongly sloping phase.	12 to 20				
	Cumberland silt loam:					
Cp	Gently sloping phase	2 to 5	Stratified soil materials ranging from silt loam or silty clay loam to clay (ML to CH; A-4 to A-7). This alluvium, located on high stream terraces, was derived chiefly from limestone.	10 or more	10 or more	Well drained.
Cr [1]	Eroded gently sloping phase	2 to 5				
Cs	Eroded sloping phase	5 to 12				
	Cumberland silty clay loam:					
Ct	Severely eroded gently sloping phase.	2 to 5				
Cu	Severely eroded sloping phase	5 to 12				
Da	Decatur silty clay, severely eroded sloping phase.	5 to 12	Predominantly silty clay and clay (MH, CL, or CH; A-6 or A-7) soil materials over limestone bedrock.	10 or more	6 to 12 or more.	Well drained.
Db [1]	Decatur silty clay loam, eroded gently sloping phase.	2 to 5				
	Dellrose cherty silt loam:					
Dc	Eroded strongly sloping phase	12 to 20	2 to 4 feet of soil materials ranging from cherty silt loam to cherty silty clay loam (GM or ML; A-4 or A-6) over silty clay loam (CL; A-6). This colluvium or local alluvium was weathered chiefly from cherty limestone. Bedrock is clayey limestone.	20 or more	5 to 12	Well to somewhat excessively drained.
Dd [1]	Moderately steep phase	20 to 30				
De	Steep phase	30+				
	Dellrose cherty silty clay loam:					
Df	Severely eroded strongly sloping phase.	12 to 20				
Dg	Severely eroded moderately steep phase.	20 to 30				
	Dickson silt loam:					
Dh [1]	Gently sloping phase	2 to 5	3 to 5 feet of silt loam and silty clay loam (ML or CL; A-4 or A-6) soil material over residual material (ML or CL; A-6 or A-7) of cherty limestone.	2	6 to 12 or more.	Moderately well drained.
Dk	Eroded gently sloping phase	2 to 5				
	Dunning silt loam:					
Dm	Drained overwash phase	0 to 2	Soil materials range from silt loam or silty clay loam (ML or CL; A-4 or A-6) near the surface to clay (CL or CH; A-7) at about 1 to 3 feet. Below this depth occur stratified layers, mainly of sandy clay to clay (CL or CH; A-6 or A-7), but in places of silt loam or silty clay loam (CL; A-6). The overwash phase has a silty to loamy surface deposit 5 to 12 inches thick. This recent alluvium was derived chiefly from clayey limestone.	0	3 to 12 or more.	Somewhat poorly drained.
Dn [1]	Silty substratum phase	0 to 2				
Do [1]	Dunning silty clay loam, drained phase.	0 to 2				
Ea [1]	Emory silt loam	0 to 5	Silt loam and silty clay loam (ML or CL; A-4 or A-6) soil materials. This colluvium or local alluvium was derived mainly from limestone. Bedrock generally is limestone.	0	4 to 8 or more.	Well drained.
	Etowah silt loam:					
Eb [1]	Eroded gently sloping phase	2 to 5	Stratified, mainly silty clay loam and silty clay (MH or CL; A-6 or A-7) soil materials. This alluvium, occurring on medium-high stream terraces, was derived from limestone and some sandstone. Bedrock is clayey limestone.	10 or more	6 to 12 or more.	Well drained.
Ec	Eroded gently sloping phosphatic phase.	2 to 5				
Ed	Eroded sloping phosphatic phase.	5 to 12				

Ee	Etowah silty clay loam, severely eroded sloping phase.	5 to 12				
Ga	Gravelly alluvial land	1 to 5	Stony, gravelly or cobbly, and sandy alluvium with small amounts of silty or clayey materials. These deposits occur in small narrow areas along perennial streams, intermittent drainageways, and overflow channels.	0	3 or more	Variable.
Gb	Greendale cherty silt loam	0 to 5	Silt loam and silty clay loam (ML or CL; A-4 or A-6) soil materials. Recent colluvium and alluvium derived mainly from cherty limestone. In the cherty silt loam, chert fragments, ½ to 6 inches in diameter, make up 15 to 30 percent of the mass.	0	6 to 10 or more.	Moderately well to well drained.
Gc [1]	Greendale silt loam	0 to 5				
Gd	Gullied land	5 to 30	Predominantly silty clay and clay (MH or CH; A-7) soil materials over limestone. Contains considerable chert in places. Bedrock outcrops are common Gullies usually occupy more than 60 percent of the area.	10 or more	2 to 12 or more.	Poorly drained.
Ge [1]	Guthrie silt loam	0 to 2	About 8 inches of silt loam (ML; A-4) loesslike soil material over silty clay loam and silty clay (CL; A-6 or A-7) soil material over cherty limestone. The overwash phase has a recent deposit of soil material 5 to 12 inches thick. A fragipan, ½ to 2½ feet thick, may occur at depths of 12 to 40 inches.	0	6 to 12 or more.	Poorly drained.
Gf	Guthrie silt loam, overwash phase.	0 to 2				
Ha [1]	Hamblen fine sandy loam	0 to 2	½ to 1½ feet of fine sandy loam (ML; A-4) soil material over stratified materials that range from silty sand to clay loam (SM to CL; A-2 to A-6). This recent alluvium was derived primarily from sandstone.	0	3 to 12 or more.	Somewhat poor to moderately well drained.
Hb	Hamblen fine sandy loam, local alluvium phase.	0 to 2				
	Hartsells fine sandy loam:					
Hc [1]	Gently sloping phase	2 to 5	½ to 1 foot of fine sandy loam (SM or ML; A-4) soil material over materials ranging from fine sandy loam to clay loam (SM to CL; A-2 to A-6). Bedrock is sandstone.	10 or more	2 to 6	Well drained.
Hd	Sloping phase	5 to 12				
He	Hermitage cherty silt loam, eroded sloping phase.	5 to 12	Predominantly silty clay loam (CL; A-4 or A-6) soil material below ½ to 1 foot. This old colluvium was derived from limestone. The cherty soil contains enough chert fragments, ½ to 4 inches in diameter, to interfere with tillage.	10 or more	10 or more	Well drained.
	Hermitage silt loam:					
Hf	Gently sloping phase	2 to 5				
Hg [1]	Eroded gently sloping phase	2 to 5				
Hh	Eroded sloping phase	5 to 12				
	Holston loam:					
Hm [1]	Gently sloping phase	2 to 5	Stratified loam, clay loam, and sandy clay loam (ML or CL; A-4, A-6, or A-7) soil materials. This alluvium occurs on medium high to high stream terraces and was derived from sandstone and some limestone. Bedrock is cherty limestone.	10 or more	5 to 10 or more.	Well drained.
Hn	Eroded gently sloping phase	2 to 5				
Ho	Sloping phase	5 to 12				
Hp	Eroded sloping phase	5 to 12				
Hk	Holston clay loam, severely eroded sloping phase.	5 to 12				
Hr [1]	Humphreys silt loam, gently sloping phase.	2 to 5	Stratified soil material, mainly silt loam and silty clay loam (ML or CL; A-4 or A-6). This alluvium occurs on low stream terraces and was derived from limestone. Some areas are subject to flooding for brief periods in winter.	0	5 to 12 or more.	Well drained.
	Huntington cherty silt loam:					
Hs	Local alluvium phosphatic phase.	1 to 5	The silt loam type consists of ½ to 1½ feet of silt loam (ML or CL; A-4) over stratified soil materials that range from fine sandy loam to silty clay loam (ML or CL; A-4 or A-6). The cherty soils contain enough fragments, ¼ to 6 inches in diameter, to interfere somewhat with the use of farm equipment. They also commonly have gravel beds at depths of 2 to 3 feet. These colluvial and recent alluvial flood-plain deposits are derived from cherty limestone.	0	3 to 10 or more.	Well drained.
Ht	Phosphatic phase	0 to 5				
	Huntington silt loam:					
Hu	Local alluvium phosphatic phase.	0 to 5				
Hv [1]	Phosphatic phase	0 to 5				

See footnote at end of table.

TABLE 7.—*Selected characteristics significant to engineering*—Continued

Symbol	Soil	Slope	Description and engineering classification of soil	Depth to seasonally high water table	Depth to bedrock	Natural drainage
		Percent		*Feet*	*Feet*	
La [1]	Lawrence silt loam	0 to 2	½ to 1 foot of silt loam (ML or CL; A–4) over soil materials that range from silt loam to silty clay (ML or CL; A–4, A–6, or A–7) over cherty limestone. A firm fragipan, ½ to 2½ feet thick, may occur at various depths. Because runoff and internal drainage are slow, the soil remains saturated long after extended wet periods.	0	6 to 12 or more.	Somewhat poorly drained.
Lb [1]	Lee silt loam	0 to 2	Stratified soil materials, mainly silt loam and silty clay loam (ML or CL; A–4 or A–6). This soil, however, may have strata of gravelly or sandy material below 3 feet. This recent alluvium was derived from limestone.	0	3 to 12 or more.	Poorly drained.
	Lindside cherty silt loam:					
Lc	Local alluvium phosphatic phase.	0 to 3	The silt loam type consists of about 1 foot of silt loam (ML or CL; A–4) over stratified soil materials ranging from silt loam to silty clay (ML or CL; A–4, A–6, or A–7). The cherty soils contain enough fragments, ½ to 6 inches in diameter, to make the soil difficult to cultivate. Strata of gravelly and sandy materials may occur below 4 feet. This recent alluvium was derived from limestone. Depressed areas are flooded in winter and early spring.	0	3 to 12 or more.	Somewhat poorly to moderately well drained.
Ld	Phosphatic phase	0 to 2				
	Lindside silt loam:					
Le [1]	Local alluvium phase	1 to 3				
Lf [1]	Phosphatic phase	0 to 2				
Lg	Lobelville cherty silt loam, local alluvium phase.	0 to 3	The silt loam type consists of about 1 foot of silt loam (ML or CL; A–4) over stratified layers of silt loam and silty clay loam (ML or CL; A–4 or A–6). Below 2 feet, strata may include sand and gravel. The cherty soil differs from the above in chert content; fragments ½ to 3 inches in diameter are sufficient to interfere materially with tillage operations. This young alluvium was derived chiefly from low-grade limestone and occurs along nearly level flood plains.	0	3 to 12 or more.	Somewhat poorly to moderately well drained.
Lh [1]	Lobelville silt loam	0 to 3				
Lk	Lobelville silt loam, local alluvium phase.	0 to 3				
Ma	Made land		Areas filled with soil material or trash	10 or more	5 to 20 or more.	Variable.
	Mimosa cherty silt loam:					
Mb [1]	Eroded sloping phase	5 to 12	Predominantly silty clay and clay (MH or CH; A–6 or A–7) soil materials over clayey limestone. The cherty soils have about 1 foot of cherty colluvium on the surface. The fragments are as much as 6 inches in diameter.	10 or more	3 to 8	Well drained.
Mc	Eroded strongly sloping phase	12 to 20				
	Mimosa cherty silty clay loam:					
Md	Severely eroded sloping phase	5 to 12				
Me, Mg, Mm	Severely eroded strongly sloping phase.	12 to 20				
	Mimosa silty clay:					
Mf	Severely eroded sloping phase	5 to 12				
	Mimosa silty clay loam:					
Mh	Eroded gently sloping phase	2 to 5				
Mk [1]	Eroded sloping phase	5 to 12				
	Mimosa, Baxter, and Colbert very rocky soils:					
Mn [1]	Strongly sloping phases	12 to 20	Limestone outcrops and loose fragments occupy 10 to 25 percent of the surface. The soil material ranges from silt loam to clay (ML to CH; A–4 to A–7).	20 or more	0 to 3	Well drained.
Mo	Moderately steep phases	20 to 30				
	Monongahela loam:					
Mp	Level phase	0 to 2	In the upper 3 feet soil materials range from loam to clay loam (ML or CL; A–4 or A–6); sandy clay loam to clay (CL or CH; A–6 or A–7) at greater depths. This alluvial deposit occupies medium high and	2	5 to 8 or more.	Moderately well drained.
Mr [1]	Gently sloping phase	2 to 5				
Ms	Eroded gently sloping phase	2 to 5				

			high stream terraces and was derived from sandstone and some limestone. A compacted fragipan, ½ to 2 feet thick, occurs at an average depth of 28 inches. Bedrock is limestone.			
	Mountview silt loam:					
Mt [1]	Gently sloping phase	2 to 5	1 to 3½ feet of silt loam or silty clay loam (ML or CL; A–4 or A–6) soil material over cherty silty clay loam or silty clay (MH or CL; A–7). Bedrock is cherty limestone.	10 or more	6 to 12 or more.	Well drained.
Mu	Eroded gently sloping phase	2 to 5				
Mv	Sloping phase	5 to 12				
Mw	Eroded sloping phase	5 to 12				
Mx [1]	Gently sloping shallow phase	2 to 5				
My	Eroded gently sloping shallow phase.	2 to 5				
Mz	Sloping shallow phase	5 to 12				
Mza	Eroded sloping shallow phase	5 to 12				
	Mountview silty clay loam:					
Mzb	Severely eroded gently sloping phase.	2 to 5				
Mzc	Severely eroded sloping phase	5 to 12				
Mzd	Severely eroded gently sloping shallow phase.	2 to 5				
Mze	Severely eroded sloping shallow phase.	5 to 12				
Mzf [1]	Muskingum stony fine sandy loam, strongly sloping phase.	12 to 20	Stony fine sandy loam and stony fine sandy clay loam (ML or CL; A–4 or A–6) soil materials over sandstone.	20 or more	Less than 4	Excessively drained.
Na	Nolichucky clay loam, severely eroded sloping phase.	5 to 12	Soil material is stratified; within the uneroded phase it ranges from loam (ML or CL; A–4 or A–6) near the surface to clay loam and sandy clay (MH or CL; A–6 or A–7) at depths greater than 2 or 3 feet. This alluvium occupies high stream terraces and was derived from sandstone and some limestone. Bedrock is limestone.	10 or more	10 or more	Well drained.
	Nolichucky loam:					
Nb [1]	Gently sloping phase	2 to 5				
Nc	Eroded gently sloping phase	2 to 5				
	Pace cherty silt loam:					
Pa [1]	Eroded gently sloping phosphatic phase.	2 to 5	Cherty silt loam and cherty silty clay loam (GM, ML, or CL; A–4) soil materials. This colluvium and local alluvium was derived from cherty limestone. Bedrock is clayey limestone. Chert fragments, ¼ to 4 inches in diameter, are numerous enough to interfere with cultivation. A fragipan, ½ to 1 foot thick, commonly occurs at depths of 32 to 48 inches in the gently sloping areas.	5	8 or more	Moderately well to well drained.
Pb	Eroded sloping phosphatic phase.	5 to 12				
Pc	Eroded gently sloping phase	2 to 5				
Pd	Eroded sloping phase	5 to 12				
Pe [1]	Pembroke silt loam, eroded gently sloping phase.	2 to 5	1½ to 4 feet of silt loam and silty clay loam (ML or CL; A–4 or A–6) loesslike soil materials over silty clay and clay (MH or CH; A–6 or A–7). Bedrock is limestone.	10 or more	8 to 12 or more.	Well drained.
Pf [1]	Prader fine sandy loam	0 to 2	Stratified fine sandy loam, sandy clay loam, and loam (ML or CL; A–4 or A–6) soil materials. This recent alluvium was derived from sandstone and some limestone.	0	3 to 12 or more.	Poorly drained.
Pg [1]	Purdy loam	0 to 2	Soil material in the upper 2 or 3 feet ranges from loam or fine sandy loam to silty clay loam (ML or CL; A–4 or A–6), underlain by stratified soil materials ranging from sandy clay to clay (MH or CH; A–6 or A–7). This old alluvium occupies terrace lands and was derived from sandstone and some limestone. A compact layer as much as 2 feet thick may occur at a depth of 2 or 3 feet.	0	4 to 12 or more.	Poorly drained.
Ph	Purdy loam, overwash phase	0 to 2				

See footnote at end of table.

TABLE 7.—*Selected characteristics significant to engineering*—Continued

Symbol	Soil	Slope	Description and engineering classification of soil	Depth to seasonally high water table	Depth to bedrock	Natural drainage
		Percent		*Feet*	*Feet*	
Ra[1]	Robertsville silt loam	0 to 2	1 to 2 feet of silt loam and silty clay loam (ML or CL; A-4 or A-6) soil materials over stratified layers of silty clay, clay, or sandy clay (MH or CH; A-6 or A-7). This alluvium generally occupies low stream terraces and was derived from limestone and some sandstone. A compacted layer 2 to 3 feet thick is present at depths of 1½ to 2½ feet.	0	4 to 12 or more.	Poorly drained.
Rb	Robertsville silt loam, overwash phase.	0 to 2				
	Rockland:					
Rc	Sloping	5 to 12	Limestone outcrops cover from 25 to 50 percent or more of the surface area; large limestone boulders occur in places. The soil material consists of silty clay or clay (MH or CH; A-7).	20 or more	0 to 3 or more.	Rapid runoff
Rd	Moderately steep	12 to 75				
Re	Rock outcrop		Sandstone cliffs with negligible soil material	20 or more	0	Rapid runoff.
Sa[1]	Sango silt loam	0 to 5	Mainly silt loam (ML or CL; A-4) loesslike soil material over clayey residuum (CL; A-6 or A-7) from cherty limestone. A fragipan, ½ to 2½ feet thick, occurs at a depth of about 2 feet.	2	6 to 12 or more.	Moderately well drained.
Sb	Sequatchie cobbly fine sandy loam, gently sloping phase.	2 to 5	Soil materials generally range from fine sandy loam or fine sandy clay loam (ML or CL; A-4) near the surface to clay loam, fine sandy loam, or fine sandy clay (ML or CL; A-4 or A-6) at about 3 feet. This alluvium was derived from sandstone and some limestone. It occurs on low stream terraces.	0	6 to 12 or more.	Well drained.
	Sequatchie fine sandy loam:					
Sc	Level phase	0 to 2				
Sd[1]	Gently sloping phase	2 to 5				
Se	Eroded gently sloping phase	2 to 5				
Sf	Sequatchie sandy clay loam, severely eroded sloping phase.	5 to 12				
Sg[1]	Staser fine sandy loam	0 to 5	About 1 foot of fine sandy loam (ML; A-4) soil material over stratified loamy fine sand, fine sandy loam, and loam (SM or ML; A-2 or A-4). This bottom land, alluvial soil was derived from sandstone and some limestone. Below 3 feet the strata may include sand or gravel, or a stratum may be composed of sandy clay loam (CL; A-6).	0	3 to 12 or more.	Well drained.
Sh	Staser fine sandy loam, local alluvium phase.	0 to 5				
Sk	Swaim silty clay, severely eroded sloping phase.	5 to 12	Predominantly very plastic clay and silty clay (CH; A-7) colluvium and local alluvium derived from clayey limestone.	5	6 or more	Moderately well to well drained.
Sm	Swaim silty clay loam, eroded gently sloping phase.	2 to 5				
Ta[1]	Taft silt loam	0 to 5	About 1 foot of silt loam (ML or CL; A-4) soil material over silty clay loam or silty clay (CL; A-6 or A-7). This alluvium was derived from limestone and some sandstone and generally occupies low stream terraces. The overwash phase has a thicker silt loam surface layer. A fragipan, 1 to 1½ feet thick, normally occurs at a depth of 1½ to 3 feet.	0	12 or more	Somewhat poorly drained.
Tb	Taft silt loam, overwash phase	0 to 5				
Tc[1]	Talbott cherty silty clay loam, severely eroded strongly sloping phase.	12 to 20	Predominantly cherty silty clay or cherty clay (MH or CH; A-7) soil materials over cherty clayey limestone. Bedrock outcrops are common. Chert fragments range from ½ to 6 inches in diameter.	10 or more	0 to 5 or more	Well drained.

Td[1]	Tyler loam	0 to 5	Soil materials are loam and clay loam (ML or CL; A-4 or A-6), underlain by a fragipan, ½ to 2 feet thick; at a depth of 1½ to 3 feet. Below this, stratified materials range from clay loam to mixtures of clay and gravel (SC to CL; A-2 to A-6). Fragipan is absent in places. This old alluvium occupies terraces and was derived from sandstone and some limestone.	0	4 to 12 or more.	Somewhat poorly drained.
Te	Tyler loam, overwash phase	0 to 5				
	Waynesboro clay loam:					
Wa	Severely eroded gently sloping phase.	2 to 5	The stratified soil materials range from loam or clay loam (ML or CL; A-4 or A-6) near the surface to clay, silty clay, sandy clay, or clay loam (MH, CL, or CH; A-7) at a depth of 4 to 5 feet. The old alluvium occupies high stream terraces and was derived from sandstone and some limestone. Bedrock is generally limestone.	10 or more	10 or more	Well drained.
Wb	Severely eroded sloping phase	5 to 12				
Wc	Severely eroded strongly sloping phase.	12 to 20				
	Waynesboro loam:					
Wd[1]	Gently sloping phase	2 to 5				
We	Eroded gently sloping phase	2 to 5				
Wf	Sloping phase	5 to 12				
Wg	Eroded sloping phase	5 to 12				
Wh, Wk	Strongly sloping phase	12 to 20				
	Whitwell loam:					
Wm	Level phase	0 to 2	Soil materials are stratified and range from loam to fine sandy clay loam (ML or CL; A-4 or A-6). This alluvium occupies low stream terraces and was derived from sandstone and some limestone.	0	6 to 12 or more.	Moderately well drained.
Wn[1]	Gently sloping phase	2 to 5				
Wo	Eroded gently sloping phase	2 to 5				

[1] Estimated physical properties of soil material within this unit are given in table 8.

TABLE 8.—*Estimated physical properties of the soil materials*

Map symbol	Soil or land type [1]	Depth from surface	Classification		Structure	Suitability as topsoil	Shrink-swell potential	pH
			Unified	A. A. S. H. O.				
		Inches						
Aa	Armour silt loam, eroded gently sloping phase.	0–10	ML or CL	A–4	Granular to subangular blocky.	Good	Low	5. 1–6. 5
		10–45	CL	A–4 or A–6	Subangular blocky	Good to fair	Moderate	5. 1–6. 5
		45–60	GC, MH, or CL.	A–2, A–6, or A–7.	Subangular blocky	Fair	Moderate to high.	5. 1–6. 5
Bb	Baxter cherty silt loam, sloping phase	0–9	GM or ML	A–4	Crumb to subangular blocky.	Fair	Low	5. 1–5. 5
		9–48	GM or CL	A–7	Blocky	Poor	High	5. 1–5. 5
		48–60+	GC or CH	A–7	Blocky	Not suitable	High	5. 1–5. 5
Bn	Bodine cherty silt loam, moderately steep phase.	0–9	GM or ML	A–4	Granular	Poor	Low	5. 1–5. 5
		9–22	GM or GC	A–4	Subangular blocky	Poor	Low	4. 5–5. 5
		22–96	GM or GC	A–2 or A–4		Not suitable	Low	
Bp	Bouldery colluvial land, strongly sloping phase.					Not suitable		
Br	Bruno loamy fine sand	0–12	SM	A–2	Structureless	Poor	Low	5. 6–6. 5
		12–30	SM or ML	A–2 or A–4		Poor	Low	5. 6–6. 0
		30+	SM or ML	A–2 or A–4		Poor	Low	
Cb	Captina silt loam, gently sloping phase	0–8	ML or CL	A–4	Granular	Good	Low	5. 1–5. 5
		8–38	CL	A–4 or A–6	Subangular blocky to blocky.	Fair to poor	Moderate	5. 1–6. 0
		38+	MH or CL	A–6 or A–7	Blocky	Poor	Moderate to high.	
Cd	Cookeville silt loam, gently sloping phase.	0–10	ML or CL	A–4	Granular or subangular blocky.	Good	Low	5. 1–6. 0
		10–45	MH or CH	A–7	Blocky	Good to fair	High	5. 1–6. 0
		45–60+	MH or CH	A–7	Blocky	Poor	High	5. 1–6. 0
Cr	Cumberland silt loam, eroded gently sloping phase.	0–12	ML or CL	A–4 or A–6	Granular to subangular blocky.	Good	Moderate	5. 1–6. 0
		12–85	MH, CL, or CH.	A–4, A–6, or A–7.	Subangular blocky to blocky.	Good to fair	High	5. 1–6. 0
		85–96+	MH, CL, or CH.	A–4, A–6, or A–7	Blocky	Fair	Moderate to high.	5. 1–6. 0
Db	Decatur silty clay loam, eroded gently sloping phase.	0–6	CL	A–4 or A–6	Granular	Good	Moderate	5. 1–6. 0
		6–14	MH or CL	A–6 or A–7	Subangular blocky	Good to fair	Moderate to high.	5. 1–6. 0
		14–66	CL or CH	A–7	Blocky	Poor	High	5. 1–6. 0
		66+	CH	A–7	Blocky	Poor	High	5. 1–6. 0
Dd	Dellrose cherty silt loam, moderately steep phase.	0–14	GM or ML	A–4	Granular to subangular blocky.	Good	Low	5. 1–6. 0
		14–48	CL	A–6	Subangular blocky	Fair	Moderate	5. 1–6. 0
		48–65	CL	A–6	Blocky	Fair	Moderate	
Dh	Dickson silt loam, gently sloping phase	0–9	ML or CL	A–4	Granular to subangular blocky.	Good	Low	4. 5–5. 5
		9–27	CL	A–4	Subangular blocky	Fair	Low	4. 5–5. 5
		27–48	CL	A–6	Blocky	Poor	Moderate	5. 1–5. 5
		48–54+	CL	A–7		Poor	High	
Dn	Dunning silt loam, silty substratum phase.	0–15	ML or CL	A–4	Granular	Good	Low	6. 1–6. 5
		15–30	CL	A–4 or A–6	Granular	Fair	Moderate	6. 1–7. 3
		30+	ML or CL	A–4 or A–6	Structureless	Fair to poor	Moderate	5. 1–6. 0
Do	Dunning silty clay loam, drained phase	0–15	CL	A–4 or A–6	Granular	Fair	Moderate	6. 6–7. 3
		15–30	MH or CH	A–7	Granular to subangular blocky.	Poor	High	6. 6–7. 3
		30+	MH or CH	A–7	Structureless	Poor	High	6. 1–6. 5

Ea	Emory silt loam	0–15	ML or CL	A–4	Granular to subangular blocky.	Good	Low	5. 6–6. 5
		15–26	ML or CL	A–4 or A–6	Granular to subangular blocky.	Good	Moderate	5. 6–6. 5
		26–40+	CL	A–4 or A–6	Subangular blocky	Fair	Moderate	5. 6–6. 5
Eb	Etowah silt loam, eroded gently sloping phase.	0–8	ML or CL	A–4	Granular	Good	Low	5. 6–6. 0
		8–40	MH, CL, or CH.	A–6 or A–7	Subangular blocky	Good to fair	Moderate to high.	5. 1–6. 0
		40–60+	MH, CL, or CH.	A–6 or A–7	Blocky	Fair	Moderate to high.	5. 1–5. 5
Ga	Gravelly alluvial land					Not suitable		
Gc	Greendale silt loam	0–12	ML or CL	A–4	Granular	Good	Low	5. 1–6. 0
		12–24	ML or CL	A–4 or A–6	Granular	Good	Moderate	5. 6–6. 0
		24–36+	ML or CL	A–4 or A–6	Subangular blocky	Fair	Moderate	
Gd	Gullied land					Poor		
Ge	Guthrie silt loam	0–8	ML	A–4	Granular	Good to fair	Low	4. 5–5. 5
		8–32	CL	A–4 or A–6	Subangular blocky	Poor	Moderate	4. 5–5. 5
		32–52	CL	A–6 or A–7		Poor	Moderate to high.	4. 5–5. 5
		52–64+	CL	A–6 or A–7		Poor	Moderate to high.	4. 5–5. 5
Ha	Hamblen fine sandy loam	0–12	ML	A–4	Granular	Good	Low	5. 6–7. 3
		12–24	ML or CL	A–4	Granular	Good	Low	5. 6–7. 3
		24–36+	ML or CL	A–4	Structureless	Good	Low	
Hc	Hartsells fine sandy loam, gently sloping phase.	0–10	SM or ML	A–4	Granular	Good	Low	4. 5–5. 5
		10–30	ML or CL	A–4 or A–6	Subangular blocky	Fair	Moderate	4. 5–5. 5
		30–48	ML or CL	A–4 or A–6	Subangular blocky	Poor	Moderate	
Hg	Hermitage silt loam, eroded gently sloping phase.	0–9	ML or CL	A–4	Granular	Good	Low	5. 6–6. 0
		9–45	CL	A–4 or A–6	Subangular blocky	Good	Moderate	5. 1–6. 0
		45–60+	CL	A–4 or A–6	Blocky	Fair	Moderate	
Hm	Holston loam, gently sloping phase	0–8	ML	A–4	Granular to subangular blocky.	Good	Low	4. 5–5. 5
		8–36	ML or CL	A–4 or A–6	Blocky	Fair	Moderate	4. 5–5. 5
		36–54	ML or CL	A–6 or A–7		Fair	Moderate to high.	4. 5–5. 5
Hr	Humphreys silt loam, gently sloping phase.	0–8	ML or CL	A–4	Granular or subangular blocky.	Good	Low	5. 1–6. 0
		8–34	ML or CL	A–4 or A–6	Subangular blocky	Good	Moderate	5. 1–5. 5
		34–60+	GM or GC	A–4 or A–7		Fair	Moderate to high.	5. 1–5. 5
Hv	Huntington silt loam, phosphatic phase	0–12	ML or CL	A–4	Granular	Good	Low	6. 1–7. 3
		12–30	ML or CL	A–4 or A–6	Subangular blocky	Good	Moderate	6. 1–7. 3
		30–36+	ML or CL	A–4 or A–6		Good	Moderate	6. 1–6. 5
La	Lawrence silt loam	0–7	ML or CL	A–4	Granular	Good to fair	Low	4. 5–5. 5
		7–24	CL	A–4 or A–6	Subangular blocky	Fair to poor	Low	4. 5–5. 5
		24–47	CL	A–6	Blocky	Fair to poor	Moderate	4. 5–5. 5
		47–60+	CL	A–6 or A–7	Blocky	Poor	Moderate to high.	5. 1–5. 5
Lb	Lee silt loam	0–6	ML or CL	A–4	Granular	Good	Low	5. 1–5. 5
		6–24	ML or CL	A–4 or A–6	Granular	Good to fair	Moderate	4. 5–5. 5
		24–42+	ML or CL	A–6 or A–7	Subangular blocky	Poor	Moderate to high.	4. 5–5. 5
Le	Lindside silt loam, local alluvium phase	0–14	ML or CL	A–4		Good	Low	5. 6–6. 5
		14–26	ML or CL	A–4 or A–6		Good to fair	Moderate	5. 6–6. 5
		26–40+	CL	A–4 ro A–6		Fair to poor	Moderate	
Lf	Lindside silt loam, phosphatic phase	0–10	ML or CL	A–4	Granular	Good	Low	6. 1–7. 3
		10–18	ML or CL	A–4 or A–6	Granular	Good	Moderate	6. 1–7. 3
		18–30	CL	A–6 or A–7	Subangular blocky	Fair to poor	Moderate to high.	6. 1–6. 5
		30–45+	CL	A–6 or A–7	Structureless	Fair to poor	Moderate to high.	
Lh	Lobelville silt loam	0–12	ML or CL	A–4	Granular	Good	Low	5. 1–6. 0
		12–22	ML or CL	A–4 or A–6	Granular to subangular blocky.	Good	Moderate	5. 1–5. 5
		22–36	CL	A–4 or A–6		Fair	Moderate	5. 1–5. 5

See footnote at end of table.

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TABLE 8.—*Estimated physical properties of the soil materials*—Continued

Map symbol	Soil or land type [1]	Depth from surface	Classification		Structure	Suitability as topsoil	Shrink-swell potential	pH
			Unified	A. A. S. H. O.				
Ma	Made land							
Mb	Mimosa cherty silt loam, eroded sloping phase.	0–6	GC or CL	A–4 or A–6	Granular	Good	Low	
		6–12	CL	A–6	Subangular blocky	Fair	Low	
		12–60+	MH or CH	A–7	Blocky	Poor	High	
Mk	Mimosa silty clay loam, eroded sloping phase.	0–6	CL	A–6	Granular or subangular blocky.	Good	Moderate	5. 1–6. 0
		6–42	MH or CH	A–7	Blocky	Poor	High	5. 1–5. 5
		42–60+	CH	A–7	Blocky	Poor	High	5. 1–5. 5
Mn	Mimosa, Baxter, and Colbert very rocky soils, strongly sloping phases.	0–5	GC or CL	A–4 or A–6		Fair	Moderate	
		5–12	MH or CL	A–6 or A–7		Not suitable	Moderate to high.	
		12–25+	MH or CH	A–7		Not suitable	High	
Mr	Monongahela loam, gently sloping phase	0–12	CL	A–4	Granular to subangular blocky.	Good	Moderate	4. 5–5. 5
		12–28	CL	A–4 or A–6	Subangular blocky to blocky.	Fair	Moderate	5. 1–5. 5
		28–39	ML or CL	A–4 or A–6	Structureless	Poor	Moderate	4. 5–5. 5
		39–60+	CL or CH	A–6 or A–7	Blocky	Fair to poor	Moderate to high.	4. 5–5. 5
Mt	Mountview silt loam, gently sloping phase.	0–10	ML or CL	A–4	Granular to subangular blocky.	Good	Low	4. 5–5. 5
		10–36	CL	A–6 or A–7	Subangular blocky	Fair	Moderate	5. 1–5. 5
		36–52	MH or CL	A–7	Blocky	Poor	High	
Mx	Mountview silt loam, gently sloping shallow phase.	0–9	ML or CL	A–4		Good	Low	
		9–16	CL	A–6 or A–7		Fair	Moderate	
		16–28+	MH or CL	A–7		Poor	Moderate	
Mzf	Muskingum stony fine sandy loam, strongly sloping phase.	0–8	ML	A–4	Granular	Poor	Low	4. 5–5. 5
		8–18	ML or CL	A–4 or A–6	Subangular blocky	Not suitable	Moderate	4. 5–5. 0
Nb	Nolichucky loam, gently sloping phase	0–11	ML or CL	A–4 or A–6	Granular	Good	Moderate	4. 5–5. 5
		11–46	CL or CH	A–6 or A–7	Subangular blocky to blocky.	Good to fair	Moderate to high.	5. 1–5. 5
		46–60	CL or CH	A–6 or A–7	Blocky	Fair	Moderate to high.	4. 5–5. 5
Pa	Pace cherty silt loam, eroded gently sloping phosphatic phase.	0–10	GM or ML	A–4	Granular to subangular blocky.	Good	Low	5. 1–6. 0
		10–47	GM, ML, or CL.	A–4 or A–6	Subangular blocky to blocky.	Fair	Low to moderate.	5. 1–5. 5
		47–60	GM or GC	A–2 or A–4	Subangular blocky or blocky.	Poor	Low	5. 1–5. 5
Pe	Pembroke silt loam, eroded gently sloping phase.	0–11	ML or CL	A–4	Granular	Good	Low	5. 1–6. 0
		11–40	CL	A–4 or A–6	Subangular blocky to blocky.	Good	Moderate	5. 1–6. 0
		40–66	MH or CH	A–7	Blocky	Fair	High	5. 1–6. 0
		66–96	CH	A–7	Blocky	Fair	High	5. 1–6. 0
Pf	Prader fine sandy loam	0–8	ML	A–4	Granular	Good	Low	5. 6–6. 5
		8–18	ML or CL	A–4 or A–6	Granular	Good	Moderate	5. 6–6. 0
		18–42+	ML or CL	A–4 or A–6		Fair to poor	Moderate	5. 1–6. 0
Pg	Purdy loam	0–10	ML or CL	A–4 or A–6	Granular or subangular blocky.	Good to fair	Moderate	4. 5–5. 0
		10–24	ML or CL	A–4 or A–6	Subangular blocky to blocky.	Fair	Moderate	4. 5–5. 5
		24–46	ML or CL	A–4 or A–6	Blocky to structureless	Poor	Moderate	4. 5–5. 5
		46–60+	MH or CH	A–7	Structureless	Poor	High	4. 5–5. 0
Ra	Robertsville silt loam	0–12	ML or CL	A–4	Granular to subangular blocky.	Good to fair	Low	4. 5–5. 5
		12–18	CL	A–4 or A–6	Subangular blocky	Fair	Moderate	4. 5–5. 0
		18–48	CH	A–7	Structureless	Poor	High	4. 5–5. 0
		48–60+	MH or CH	A–7	Blocky to structureless	Poor	High	4. 5–5. 0

Rc	Rockland, sloping					Not suitable		
Re	Rock outcrop					Not suitable		
Sa	Sango silt loam	0–11	ML or CL	A–4	Granular to subangular blocky.	Good	Low	4.5–5.5
		11–24	ML or CL	A–4	Subangular blocky or blocky.	Fair	Low	4.5–5.5
		24–42	ML or CL	A–4	Blocky	Poor	Low	4.5–5.5
		42–60+	ML or CL	A–6 or A–7	Blocky	Poor	Moderate	
Sd	Sequatchie fine sandy loam, gently sloping phase.	0–10	ML	A–4	Granular	Good	Low	5.6–6.5
		10–38	CL	A–6	Subangular blocky	Good	Moderate	5.1–6.0
		38–48+	ML or CL	A–4 or A–6	Subangular blocky	Fair	Moderate	5.1–5.5
Sg	Staser fine sandy loam	0–12	ML	A–4	Crumb	Good	Low	6.1–7.3
		12–36	SM or ML	A–2 or A–4	Granular to structureless.	Good	Low	6.1–7.3
		36+	SM or ML	A–2 or A–4	Structureless	Good	Low	5.6–7.3
Sm	Swaim silty clay loam, eroded gently sloping phase.	0–6	CL	A–4 or A–6	Subangular blocky	Good	Moderate	5.1–6.0
		6–30	CH	A–7	Structureless	Poor	High	5.1–6.0
		30–60+	CH	A–7	Structureless	Poor	High	5.1–6.0
Ta	Taft silt loam	0–14	ML or CL	A–4	Granular to subangular blocky.	Good to fair	Low	4.5–5.5
		14–25	CL	A–6	Subangular blocky	Fair	Moderate	4.5–5.5
		25–42	CL	A–6	Blocky	Poor	Moderate	5.1–5.5
		48–72+	CL	A–6 or A–7	Blocky	Poor	Moderate to high.	4.5–5.5
Tc	Talbott cherty silty clay loam, severely eroded strongly sloping phase.	0–6	CL	A–6	Subangular blocky	Fair	Moderate	5.1–5.5
		6–36	MH or CH	A–7	Subangular blocky to blocky.	Poor	High	5.1–5.5
		36–60+	CH	A–7	Blocky	Poor	High	5.1–5.5
Td	Tyler loam	0–6	ML or CL	A–4 or A–6	Granular to subangular blocky.	Good to fair	Moderate	4.5–5.5
		6–22	CL	A–6	Subangular blocky	Fair	Moderate	4.5–5.5
		22–38	CL	A–6	Blocky to structureless.	Poor	Moderate	4.5–5.5
		38–54+	CL	A–6	Blocky	Poor	Moderate	4.5–5.5
Wd	Waynesboro loam, gently sloping phase	0–11	ML or CL	A–4	Granular to subangular blocky.	Good	Moderate	5.1–6.0
		11–54	MH or CL	A–6 or A–7	Subangular blocky to blocky.	Good to fair	High	5.1–6.0
		54–72+	MH, CL, or CH.	A–7	Blocky	Fair	High	5.1–5.5
Wn	Whitwell loam, gently sloping phase	0–10	ML or CL	A–4	Granular to subangular blocky.	Good	Moderate	5.1–6.0
		10–38	ML or CL	A–4 or A–6	Subangular blocky	Fair	Moderate	5.1–6.0
		38–50+	ML or CL	A–4 or A–6	Subangular blocky	Fair	Moderate	5.1–5.5

[1] Profiles of the soils listed are described in the section Descriptions of Soils.

TABLE 9.—*Soil features affecting highway engineering*

Soil series or land type	Features affecting vertical alinement		Adaptability to earthwork during prolonged wet periods [1]	Suitability as a source of subbase material [2]
	Materials	Drainage		
Armour	Bedrock	Seepage at 2 to 3 feet	Not adaptable	Not suitable.
Baxter	Bedrock; chert fragments		Poor	Not suitable to poor.
Bodine	Chert beds at 1½ to 3 feet.		Fair	Fair.
Bouldery colluvial land	Bedrock; boulders	Seepage over bedrock	Fair [3]	Not suitable.
Bruno		Subject to flooding	Fair	Fair to good.
Captina		Subject to flooding; seepage at 2 to 3 feet over compact layer.	Not adaptable	Not suitable.
Cookeville	Bedrock [4]		Not adaptable	Not suitable.
Cumberland			Not adaptable	Not suitable.
Decatur			Not adaptable	Not suitable.
Dellrose	Bedrock	Seepage over bedrock	Fair	Poor to fair.
Dickson		Water table; seepage at 2 to 3 feet over siltpan.	Not adaptable	Not suitable.
Dunning	Bedrock	Subject to flooding	Not adaptable	Not suitable.
Emory	Bedrock	Subject to flooding	Not adaptable	Not suitable.
Etowah	Bedrock [4]		Not adaptable	Not suitable.
Gravelly alluvial land	Bedrock; cobbles	Subject to flooding	Not adaptable	Poor.
Greendale	Chert fragments	Subject to flooding	Not adaptable	Poor.[5]
Gullied land	Bedrock		Not adaptable	Not suitable.
Guthrie		Subject to flooding; seepage at 2 to 3 feet over fragipan.	Not adaptable	Not suitable.
Hamblen	Bedrock	Subject to flooding	Poor	Poor.
Hartsells	Bedrock	Seepage over bedrock	Poor	Poor to fair.
Hermitage			Not adaptable	Not suitable.
Holston	Bedrock [4]		Not adaptable	Not suitable.
Humphreys		Subject to flooding	Not adaptable	Not suitable.
Huntington	Bedrock	Subject to flooding	Not adaptable to poor.	Not suitable.
Lawrence		Subject to flooding; seepage at 2 to 3 feet over fragipan.	Not adaptable	Not suitable.
Lee	Bedrock	Subject to flooding	Not adaptable	Not suitable.
Lindside	Bedrock	Subject to flooding	Not adaptable	Poor.
Lobelville	Bedrock; chert fragments.	Subject to flooding	Not adaptable to poor.	Poor to fair (Limited).[5]
Made land	May be trash			
Mimosa	Bedrock; chert fragments in cherty phases.		Not adaptable	Not suitable.

See footnotes at end of table.

TABLE 9.—*Soil features affecting highway engineering*—Continued

Soil series or land type	Features affecting vertical alinement		Adaptability to earthwork during prolonged wet periods [1]	Suitability as a source of subbase material [2]
	Materials	Drainage		
Mimosa, Baxter, and Colbert.	Bedrock		Not adaptable	Not suitable.
Monongahela		Subject to flooding; seepage at 2 to 3 feet over fragipan.	Not adaptable	Not suitable.
Mountview	Bedrock [4]		Not adaptable	Not suitable.
Muskingum	Bedrock	Seepage over bedrock	Fair [3]	Not suitable.
Nolichucky			Not adaptable to poor.	Not suitable.
Pace		Water table; seepage at 2 to 3 feet	Poor	Not suitable.
Pembroke			Not adaptable	Not suitable.
Prader	Bedrock	Subject to flooding	Not adaptable	Poor to not suitable.
Purdy	Bedrock	Subject to flooding; seepage at 2 to 3 feet over compacted layer.	Not adaptable	Not suitable.
Robertsville	Bedrock	Subject to flooding; seepage at 2 to 3 feet over compacted layer.	Not adaptable	Not suitable.
Rockland	Bedrock; boulders		Insignificant earthwork.	Not suitable.
Rock outcrop	Bedrock		Insignificant earthwork.	Not suitable.
Sango		Water table	Not adaptable to poor.	Not suitable.
Sequatchie	Bedrock [4]	Subject to flooding	Not adaptable to poor.	Poor.
Staser	Bedrock	Subject to flooding	Poor	Poor.
Swaim	Bedrock [4]	Seepage at 2 to 3 feet	Not adaptable	Not suitable.
Taft		Subject to flooding; seepage at 2 to 3 feet over fragipan.	Not adaptable	Not suitable.
Talbott	Bedrock; chert fragments		Not adaptable	Not suitable.
Tyler	Bedrock	Subject to flooding; seepage at 2 to 3 feet over fragipan.	Not adaptable	Not suitable.
Waynesboro			Not adaptable to poor.	Not suitable.
Whitwell		Subject to flooding	Not adaptable to poor.	Not suitable.

[1] Adaptability refers to soil material; rock excavation may not be affected during prolonged wet periods.
[2] Subbase materials include A-2-4 or better materials; plasticity index should not be greater than 10.
[3] Limited by bedrock or boulders.
[4] Depth to bedrock may control location of grade on steeper slopes.
[5] Cherty soil only.

TABLE 11.—*Classification of soils by American*

General classification	Granular materials (35 percent or less passing No. 200 sieve)				
Group classification	A–1		A–3	A–2	
	A–1–a	A–1–b		A–2–4	A–2–5
Sieve analysis: Percent passing: No. 10 No. 40 No. 200	 50 maximum. 30 maximum 15 maximum	 50 maximum 25 maximum	 51 minimum. 10 maximum	 35 maximum	 35 maximum
Characteristics of fraction passing No. 40 sieve: Liquid limit Plasticity index	 ----- 6 maximum	 ----- 6 maximum	 NP[2] NP[2]	 40 maximum 10 maximum	 41 minimum 10 maximum
Group index	0	0	0	0	0
Usual types of significant constituent materials.	Stone fragments, gravel, and sand.	Stone fragments, gravel, and sand.	Fine sand	Silty gravel and sand.	Silty gravel and sand.
General rating as subgrade	Excellent to good				

[1] Based on Standard Specifications for Highway Materials and Methods of Sampling and Testing (pt. 1; ed. 7): The Classification of Soils and Soil-Aggregate Mixtures for Highway Construction Purposes, A. A. S. H. O. Designation: M 145–49.

[2] NP=nonplastic.

[3] Plasticity index of A–7–5 subgroup is equal to or less than LL minus 30. Plasticity index of A–7–6 subgroup is greater than LL minus 30.

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Granular materials (35 percent or less passing No. 200 sieve)—Continued		Silt-clay materials (More than 35 percent passing No. 200 sieve)				
A-2—Continued		A-4	A-5	A-6	A-7	
A-2-6	A-2-7				A-7-5	A-7-6
35 maximum	35 maximum	36 minimum	36 minimum	36 minimum	36 minimum	36 minimum.
40 maximum	41 minimum	40 maximum	41 minimum	40 maximum	41 minimum	41 minimum.
11 minimum	11 minimum	10 maximum	10 maximum	11 minimum	11 minimum [3]	11 minimum.[3]
4 maximum	4 maximum	8 maximum	12 maximum	16 maximum	20 maximum	20 maximum.
Clayey gravel and sand.	Clayey gravel and sand.	Nonplastic to moderately plastic silty soils.	Highly elastic silts.	Medium plastic clays.	Highly plastic clays.	Highly plastic clays.
Fair to poor						

TABLE 12.—*Characteristics of soil groups*

Major divisions	Group symbol	Soil description	Value as foundation material [2]	Value as base course directly under bituminous pavement	Value for embankments
Coarse-grained soils (*50 percent or less passing No. 200 sieve*):					
Gravels and gravelly soils (*more than half of coarse fraction retained on No. 4 sieve*).	GW	Well-graded gravels and gravel-sand mixtures; little or no fines.	Excellent	Good	Very stable; use in previous shells of dikes and dams.
	GP	Poorly graded gravels and gravel-sand mixtures; little or no fines.	Good to excellent.	Poor to fair	Reasonably stable; use in previous shells of dikes and dams.
	GM	Silty gravels and gravel-sand-silt mixtures.	Good	Poor to good	Reasonably stable; not particularly suited to shells, but may be used for impervious cores or blankets.
	GC	Clayey gravels and gravel-sand-clay mixtures.	Good	Poor	Fairly stable; may be used for impervious core.
Sands and sandy soils (*more than half of coarse fraction passing No. 4 sieve*).	SW	Well-graded sands and gravelly sands; little or no fines.	Good	Poor	Very stable; may be used in pervious sections; slope protection required.
	SP	Poorly graded sands and gravelly sands; little or no fines.	Fair to good	Poor to not suitable.	Reasonably stable; may be used in dike section having flat slopes.
	SM	Silty sands and sand-silt mixtures.	Fair to good	Poor to not suitable.	Fairly stable; not particularly suited to shells, but may be used for impervious cores or dikes.
	SC	Clayey sands and sand-clay mixtures.	Fair to good	Not suitable	Fairly stable; use as impervious core for flood-control structures.
Fine-grained soils (*more than 50 percent passing No. 200 sieve*):					
Silts and clays (*liquid limit of 50 or less*).	ML	Inorganic silts and very fine sands, rock flour, silty or clayey fine sands, and clayey silts of slight plasticity.	Fair to poor	Not suitable	Poor stability; may be used for embankments if properly controlled.
	CL	Inorganic clays of low to medium plasticity, gravelly clays, sandy clays, silty clays, and lean clays.	Fair to poor	Not suitable	Stable; use in impervious cores and blankets.
	OL	Organic silts and organic clays having low plasticity.	Poor	Not suitable	Not suitable for embankments.
Silts and clays (*liquid limit greater than 50*).	MH	Inorganic silts, micaceous or diatomaceous fine sandy or silty soils and elastic silts.	Poor	Not suitable	Poor stability; use in core of hydraulic fill dam; not desirable in rolled fill construction.
	CH	Inorganic clays having high plasticity and fat clays.	Poor to very poor.	Not suitable	Fair stability on flat slopes; use in thin cores, blankets, and dike sections of dams.
	OH	Organic clays having medium to high plasticity and organic silts.	Same	Not suitable	Not suitable for embankments.
Highly organic soils	Pt	Peat and other highly organic soils.	Not suitable	Not suitable	Not used in embankments, dams, or subgrades for pavements.

[1] Based on information in The Unified Soil Classification System, Technical Memorandum No. 3-357, Volumes 1, 2, and 3, Waterways Experiment Station, Corps of Engineers, 1953 (*12*). Ratings and ranges in test values are for guidance only. Design should be based on field survey and test of samples from construction site.

in Unified Soil Classification System [1]

Compaction: Characteristics and recommended equipment	Approximate range in A.A.S.H.O. maximum dry density [3]	Field (in-place) CBR	Subgrade modulus, k	Drainage characteristics	Comparable groups in A.A.S.H.O. classification
	Lb./cu. ft.		*Lb./sq. in./in.*		
Good; use crawler-type tractor, pneumatic-tire roller, or steel-wheel roller.	125–135	60–80	300+	Excellent	A–1.
Same	115–125	25–60	300+	Excellent	A–1.
Good, but needs close control of moisture; use pneumatic-tire or sheepsfoot roller.	120–135	20–80	200–300+	Fair to practically impervious	A–1 or A–2.
Fair, use penumatic-tire or sheepsfoot roller.	115–130	20–40	200–300	Poor to practically impervious	A–2.
Good; use crawler-type tractor or pneumatic-tire roller.	110–130	20–40	200–300	Excellent	A–1.
Same	100–120	10–25	200–300	Excellent	A–1 or A–3.
Good, but needs close control of moisture; use pneumatic-tire or sheepsfoot roller.	110–125	10–40	200–300	Fair to practically impervious	A–1, A–2, or A–4.
Fair; use pneumatic-roller or sheepsfoot roller.	105–125	10–20	200–300	Poor to practically impervious	A–2, A–4, or A–6.
Good to poor; close control of moisture is essential; use pneumatic-tire or sheepsfoot roller.	95–120	5–15	100–200	Fair to poor	A–4, A–5, or A–6.
Fair to good; use pneumatic-tire or sheepfoot roller.	95–120	5–15	100–200	Practically impervious	A–4, A–6, or A–7.
Fair to poor; use sheepsfoot roller [4]	80–100	4– 8	100–200	Poor	A–4, A–5, A–6, or A–7.
Poor to very poor; use sheepsfoot roller [4]	70– 95	4– 8	100–200	Fair to poor	A–5 or A–7.
Fair to poor; use sheepsfoot roller [4]	75–105	3– 5	50–100	Practically impervious	A–7.
Poor to very poor; use sheepsfoot roller [4]	65–100	3– 5	50–100	Practically impervious	A–5 or A–7.
Not used in embankments, dams, or subgrades for pavements				Fair to poor	None.

[2] Ratings are for subgrade and subbases for flexible pavement.
[3] Determined in accordance with test designation: T 99–49, A. A. S. H. O. (*1*).
[4] Pneumatic-tire rollers may be advisable, practically when moisture content is higher than optimum.

Glossary

Acidity. The degree of acidity of the soil mass is expressed in pH values and in words as follows (*11*):

	pH
Extremely acid	Below 4.5
Very strongly acid	4.5–5.0
Strongly acid	5.1–5.5
Medium acid	5.6–6.0
Slightly acid	6.1–6.5
Neutral	6.6–7.3
Mildly alkaline	7.4–7.8
Moderately alkaline	7.9–8.4
Strongly alkaline	8.5–9.0
Very strongly alkaline	9.1 and higher

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

Bedrock. Solid rock underlying soils.

Catena, soil. A group of soils within one zonal region developed from similar parent material but differing in characteristics because of differences in relief or drainage.

Clay. The small mineral soil grains, less than 0.002 mm. (0.000079 in.) in diameter. (Formerly included the grains less than 0.005 mm. in diameter.) The term clay also refers to soil material that contains 40 percent or more clay and less than 45 percent sand and less than 40 percent silt.

Clay skins. Coatings of clay on the soil peds or aggregates; coatings are the result of eluviation and illuviation. (*See also*, Eluviation.)

Colluvium. Deposits of rock fragments and soil material accumulated at the base of slopes through the influence of gravity; includes creep and local wash and frequently consists of somewhat mixed materials. Colluvial soils are developed from this material.

Conservability. Conservability refers to the ease with which productivity and workability can be maintained. Major factors considered are ease of conserving soil material and plant nutrients and ease of maintaining good tilth.

Consistence. A soil term expressing degree of cohesion and the resistance to forces tending to deform or rupture the aggregate. The relative mutual attraction of the particles in the whole mass, or their resistance to separation. Terms used in the report to describe consistence are *compact, firm, friable, hard, loose, plastic, slightly hard, very firm, very friable, very hard,* and *very plastic.*

Compact. Dense and firm but without cementation.

Firm. Soil material crushes under moderate pressure between thumb and forefinger, but resistance is distinctly noticeable.

Friable. Soil material crushes easily under gentle to moderate pressure between thumb and forefinger, and it coheres when pressed together.

Hard. Moderately resistant to pressure; soil material can be broken in the hands without difficultly but is barely breakable between thumb and forefinger.

Loose. Noncoherent.

Plastic. Wire formable and moderate pressure required for deformation of the soil mass.

Very firm. Soil material crushes under strong pressure; barely crushable between thumb and forefinger.

Very friable. Soil material crushes under very gentle pressure but coheres when pressed together.

Very hard. Very resistant to pressure; can be broken in the hands only with difficulty; not breakable between thumb and forefinger.

Contour tillage. Plowing, cultivating, and harvesting at right angles to the direction of slope at the same level throughout or at an acceptable grade.

Cropland. Land regularly used for crops, except forest crops. It includes rotation pasture, cultivated summer fallow, or other land ordinarily used for crops but temporarily idle.

Eluviation. The movement of soil material from one place to another within the soil, in solution or in suspension, when there is an excess of rainfall over evaporation. Horizons that have lost material through eluviation are referred to as eluvial, and those that have received material, as illuvial.

Erosion, soil. The wearing away or removal of soil material by water or wind.

Fertility, soil. The inherent quality that enables a soil to provide the proper plant nutrients in adequate amounts and in proper balance for the growth of specified plants, if light, temperature, and other factors of growth are favorable.

First bottom. Normal flood plain of a stream; land along a stream; land along a stream subject to overflow.

Forest. Land not in farms that bears a stand of trees of any age or stature, including seedlings (reproduction), but of species attaining a minimum average height of 6 feet at maturity; or land from which such a stand has been removed, but is not now restocking, and on which no other use has been substituted. Forest on farms is called farm woodland or farm forest.

Genesis. Mode of origin of the soil, particularly the process responsible for the development of the solum (horizons A and B) from the unconsolidated parent material. (*See also*, Horizon, soil.)

Granular. Roughly spherical aggregates that may be either hard or soft, usually more firm than crumb and without the distinct faces of blocky. (*See also*, Structure, soil.)

Great soil group (soil classification). A broad group of soils having common internal soil characteristics.

Green-manure crop. Any crop grown and plowed under for the purpose of improving the soil, especially by the addition of organic matter.

Horizon, soil. A layer of soil, approximately parallel to the soil surface, with characteristics produced by soil-forming processes.

Horizon A. Upper horizon of the soil mass from which material has been removed by percolating waters; the eluviated part of the solum; the surface soil. This horizon may be divided into two or more subhorizons. The A_{00} and A_0 horizons are not a part of the mineral soil; they are the accumulation of organic debris on the surface. Other subhorizons are designated as A_1, A_2, and so on.

Horizon B. Horizon to which materials have been added by percolating water; the illuviated part of the solum; the subsoil. This horizon may be divided into several subhorizons, depending on the color, structure, consistence, and character of the material deposited. These subhorizons are designated as B_1, B_2, B_3, and so on.

Horizon C. Horizon of partly weathered material underlying the B horizon; the substratum; usually the parent material; a layer of unconsolidated material, relatively little affected by the influence of organisms and presumed to be similar in chemical, physical, and mineralogical composition to the material from which at least a portion of the overlying solum has developed.

Horizon D. Any stratum underlying the C, or the B if no C is present, which is unlike C, or unlike the material from which the solum has been formed.

Illuviation. See Eluviation.

Internal drainage. Refers to the movement of water through the soil profile. This rate is affected by the texture of the surface soil and subsoil, and by the height of the ground water table, either permanent or perched. Relative terms for expressing internal drainage are *very rapid, rapid, medium, slow, very slow,* and *none.*

Leaching, soil. Removal of materials in solution.

Massive. Large uniform masses of cohesive soil, sometimes with ill-defined and irregular breakage, as in some of the fine-textured alluvial soils; structureless. (*See also*, Structure grade.)

Morphology. The constitution of the soil, including the texture, structure, consistence, porosity, color, and other physical, chemical, and biological properties of the various soil horizons that make up the soil profile.

Mottling, soil. Contrasting color spots that vary in number and size. Descriptive terms are as follows: Contrast—*faint, distinct,* and *prominent;* abundance—*few, common,* and *many;* and size—*fine, medium,* and *coarse.* The size measurements are the following: *fine,* commonly less than 5 mm. [about 0.2 in.] in diameter along the greatest dimension; *medium,* commonly ranging between 5 and 15 mm. [about 0.2 to 0.6 in.] along the greatest dimension; and *coarse,* commonly more than 15 mm. [about 0.9 in.] along the greatest dimension (*5*).

Natural drainage. Refers to those conditions which existed during the development of the soil, as opposed to altered drainage, which is commonly the result of artificial drainage or irrigation but may be due to other causes, as sudden deepening of channels or sudden blocking of drainage outlets. The following relative terms are used to express natural drainage; *excessively drained, somewhat excessively drained, well drained, moderately well drained, imperfectly* or *somewhat poorly drained, poorly drained,* and *very poorly drained.*

Excessively drained. Water is removed from the soil very rapidly. Excessively drained soils commonly are shallow to bedrock and may be steep, very porous or both. Enough precipitation commonly is lost from these soils to make them unsuitable for ordinary crop production.

Somewhat excessively drained. Water is removed from the soil rapidly so that only a relatively small part is available to plants. Only a narrow range of crops can be grown on these soils, and yields are usually low unless the soil is irrigated.

Well drained. Water is removed from the soil readily but not rapidly. A well drained soil has "good" drainage.

Moderately well drained. Water is removed from the soil somewhat slowly, so that the profile is wet for a small but significant part of the time.

Imperfectly or *somewhat poorly drained.* Water is removed from the soil slowly enough to keep it wet for significant periods, but not all of the time.

Poorly drained. Water is removed so slowly that the soil remains wet for a large part of the time. The water table is commonly at or near the surface during a considerable part of the year.

Very poorly drained. Water is removed from the soil so slowly that the water table remains at or on the surface the greater part of the time.

Normal soil. A soil having a profile in equilibrium or nearly in equilibrium with its environment; developed under good but not excessive drainage from parent material of mixed mineralogical, physical, and chemical composition; and expressing the full effects of the forces of climate and living matter.

Nutrients, plant. The elements taken in by the plant, essential to its growth, and used by it in the elaboration of its food and tissue. These include nitrogen, phosphorus, calcium, potassium, magnesium, sulfur, iron, manganese, copper, boron, zinc, and perhaps others obtained from the soil; and carbon, hydrogen, and oxygen, obtained largely from the air and water.

Parent material. The unconsolidated mass from which the soil profile develops. (*See also*, Horizon C; Profile, soil; and Substratum.)

Permeability. That quality of the soil that enables it to transmit water or air.

Phase, soil. A subdivision of the soil type generally based on variations in relief, stoniness, erosion, or other external characteristics.

Productivity, soil. The capability of a soil to produce a specified plant (or plants) under a given system of management.

Profile, soil. A vertical section of the soil, from the surface into the parent material.

Reaction. See Acidity.

Relief. The elevations or inequalities of a land surface, considered collectively.

Sand. Small rock or mineral fragments with diameters ranging between 0.05 mm. (0.002 in.) and 2.0 mm. (0.078 in.). The term sand is also applied to soils containing 90 percent or more of sand.

Series, soil. A group of soils having the same profile characteristics and the same general range in color, structure, consistence, and sequence of horizons; the same general conditions of relief and drainage; and usually a common or similar origin and mode of formation. A group of soil types closely similar in all respects except for the texture of the surface soil.

Silt. Small mineral soil grains ranging from 0.05 mm. (0.002 in.) to 0.002 mm. (0.000079 in.) in diameter.

Single grain. Each grain taken alone, as in sand; structureless. (*See also*, Structure, soil.)

Soil. The natural medium for the growth of land plants on the surface of the earth; composed of organic and mineral materials.

Soil separates. The individual size groups of soil particles, as sand, silt, and clay.

Solum. The genetic soil developed by soil-building forces. In normal soils, the solum includes the A and B horizons, or the upper part of the soil profile above the parent material.

Structure, soil. The arrangement of the individual grains and aggregates that make up the soil mass; may refer to the natural arrangement of the soil when in place and undisturbed or to the soil at any degree of disturbance. Soil structure is classified according to *grade, class,* and *type* or *subtype.*

Grade. Degree of distinctness of aggregation, and expresses the differential between cohesion within aggregates and adhesion between aggregates. Terms: *structureless* (*single grain* or *massive*), *weak, moderate,* and *strong.*

Class. Size of soil aggregates. Terms: *very fine* or *very thin, fine* or *thin, medium, coarse* or *thick,* and *very coarse* or *very thick.*

Type or *subtype.* Shapes for soil aggregates. Terms for type: *platelike, prismlike, blocklike.* Terms for subtypes: *platy prismatic, columnar, blocky, subangular blocky, granular,* and *crumb.* Example of soil-structure grade, class, and subtype: Moderate coarse blocky.

Principal structure subtypes in this county are blocky, subangular blocky, and granular. Fine blocky structure peds (aggregates) are 5 to 10 mm. [0.2 to 0.4 in.] in size; medium blocky or subangular blocky, 10 to 20 mm. [0.4 to 0.8 in.]; and coarse subangular blocky, 20 to 50 mm. [0.8 to 2.0 in.]. Fine granular structure peds are 1 to 2 mm. [0.04 to 0.08 in.] in size and medium granular structure peds are 2 to 5 mm. [0.08 to 0.2 in.] in size (*11*).

Structureless. That condition in which there is no observable aggregation or no definite orderly arrangement of natural lines of weakness. *Massive* if coherent; *single grain* if noncoherent.

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

Substratum. Material underlying the subsoil. (*See also*, Horizon, soil.)

Surface runoff. Refers to the amount of water removed by flow over the surface of the soil. The amount and rapidity of surface runoff are affected by factors such as texture, structure, and porosity of the surface soil; the vegetative covering; the prevailing climate; and the slope. The degree of surface runoff is expressed by the terms *very rapid, rapid, medium, slow, very slow,* and *ponded.*

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

Terrace (for control of surface runoff, erosion, or both). A broad surface channel or embankment constructed across the sloping lands, on or approximately on contour lines, at specific intervals. The terrace intercepts surplus surface runoff, to retard it for infiltration or to direct the flow to an outlet at nonerosive velocity.

Terrace (geologic). Old alluvial plain, usually level or smooth, bordering a stream; seldom subject to overflow; frequently a terrace is called a second bottom.

Texture. Size of individual particles making up the soil mass. The various soil separates are the size groups, as sand, silt, and clay. A coarse-textured soil is one high in sand; a fine textured soil has a large proportion of clay.

Type, soil. (1) A subgrouping under the soil series based on the texture of the surface soil. (2) A group of soils having horizon similar in differentiating characteristics and arrangement in the soil profile, and developed from a particular type of parent material.

Upland (geologic). Land consisting of material unworked by water in recent geologic time and ordinarily lying at higher elevations than the alluvial plain or stream terrace.

Variegated. Marked with streaks or spots of different colors. Used primarily to designate pattern of colors in well-drained soils.

Workability. The ease with which tillage, harvesting, and other farming operations can be accomplished.

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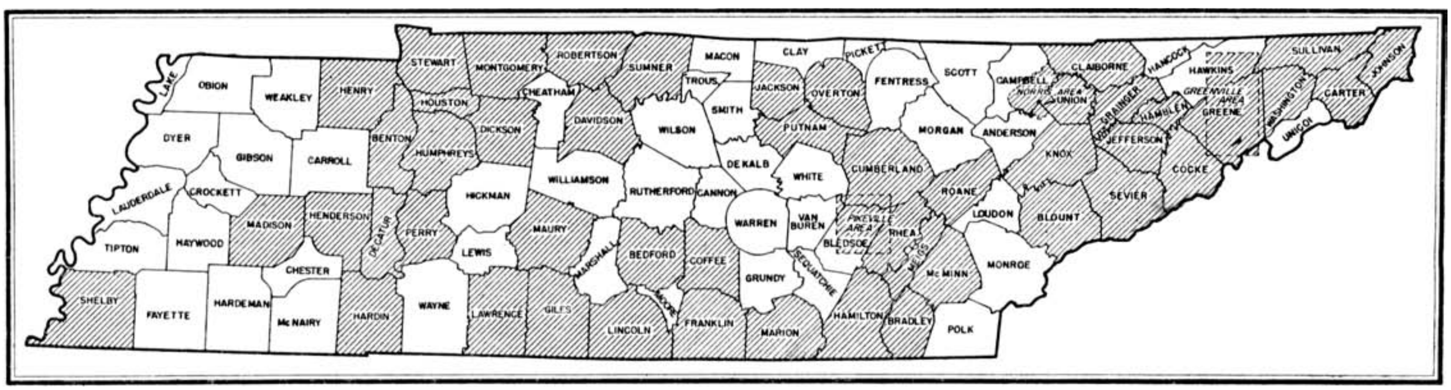

Areas surveyed in Tennessee shown by shading.

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TABLE 10.—*Engineering test data [1] for soil samples taken from 26 soil profiles*

Soil type and location	Parent material	Bureau of Public Roads report No.	Depth	Horizon	Moisture-density: Maximum dry density	Moisture-density: Optimum moisture	Mechanical analyses [2]: Percentage discarded in field sampling: 3 in. or greater	Percentage discarded in field sampling: 1 to 3 in.	Percentage passing sieve [3]: 3-in.	2-in.	1½-in.	1-in.	¾-in.	⅜-in.	No. 4 (4.7 mm.)	No. 10 (2.0 mm.)	No. 40 (0.42 mm.)	No. 60 (0.25 mm.)	No. 200 (0.074 mm.)	Percentage smaller than [3]: 0.05 mm.	0.02 mm.	0.005 mm.	0.002 mm.	Liquid limit	Plasticity index	Classification: A. A. S. H. O. [4]	Classification: Unified [5]
			Inches		*Lb. per cu. ft.*	*Percent*																					
Armour silt loam:																											
250 feet north of U. S. Highway 41 at Noah.	Alluvium underlain by limestone, chiefly phosphatic.	S30233	0-9	A_p	107	17							100	99	99	98	94	93	90	87	66	36	23	31	9	A-4(8)	ML-CL
		S30234	15-32	B_2	109	17									100	99	95	94	92	91	75	42	29	33	12	A-6(9)	CL
		S30235	42+	C	108	18						100	99	98	97	95	88	86	84	81	67	43	33	39	19	A-6(12)	CL
3.1 miles west of Noah	Same	S31021	0-8	A_p	104	19		2	100			98	97	89	84	77	66	64	61	60	46	24	17	34	9	A-4(5)	ML-CL
		S31022	16-38	B_2	107	19		10	100		90	88	86	81	77	71	62	59	58	56	46	31	23	41	19	A-7-6(8)	CL
		S31023	42-56	C	104	19	5	15	95		80	77	66	50	40	33	25	24	22	22	18	15	12	50	27	A-2-7(1)	GC
Baxter cherty silt loam:																											
3.0 miles south of county line on Viola-Hillsboro Road.	Cherty limestone	S30221	0-7	A_p	101	18	5	2	95			87	82	71	62	56	52	50	47	46	36	16	10	34	6	A-4(3)	GM
		S30222	10-32	B_2	108	18				100	96	96	96	95	95	94	89	86	81	78	71	48	36	49	28	A-7-6(17)	CL
		S30223	32	C	98	23					100	98	97	95	94	92	91	90	88	87	81	60	50	72	45	A-7-6(20)	CH
1.0 mile north of Ninth Modal School	Cherty limestone	S31008	½-6	A_2	108	16	1	1	99			94	92	86	80	75	70	68	63	60	44	19	11	27	4	A-4(6)	ML-CL
		S31009	13-33	B_2	100	22	6	4	94			86	86	85	85	83	79	78	75	71	60	40	32	52	25	A-7-6(16)	MH-CH
		S31010	48+	C	101	22	10	5	90			76	74	73	72	70	68	67	65	64	56	39	31	56	29	A-7-6(18)	CH
Bodine cherty silt loam:																											
3.9 miles west of Rutledge Falls	Cherty limestone	S30236	1-9	A_2	100	18	8	2	92			83	80	76	70	66	59	58	53	51	41	16	9	31	5	A-4(4)	ML
		S30237	9-20	C_1	107	17	38	12	62			45	42	38	36	33	29	28	26	24	20	11	8	28	6	A-4(2)	GM-GC
5.0 miles west of Manchester on Blanton Chapel Road.	Cherty limestone	S31024	0-6	A_p	104	18	2		98			96	92	81	72	63	55	53	49	46	35	16	10	29	4	A-4(3)	GM
		S31025	6-14	C_1	103	17	30	10	70		60	56	52	46	40	36	32	31	29	28	21	10	6	27	3	A-4(1)	GM
		S31026	14-24	C_2	97	21	60	10	40			29	28	27	26	25	24	23	23	22	17	9	6	33	4	A-4(5)	ML
Cookeville silt loam:																											
2.5 miles east of Summitville-Shady Grove Road and 0.1 mile north of Pocahontas-Shady Grove Road.	Limestone	S30224	2-8	A_2	111	14										100	97	96	89	84	64	29	18	24	6	A-4(8)	ML-CL
		S30225	13-32	B_2	102	21					100	99	99	99	99	99	98	98	92	89	74	54	45	54	26	A-7-6(17)	MH-CH
		S30226	32+	C	94	26										100	99	99	92	89	80	67	58	74	37	A-7-5(20)	MH
4.5 miles south of Manchester	Limestone	S31011	0-6	A_p	105	16					100	98	98	97	96	94	89	87	77	68	55	22	13	28	5	A-4(8)	ML-CL
		S31012	14-32	B_2	91	29						100	99	98	98	96	94	93	90	88	81	63	55	70	34	A-7-5(20)	MH
		S31013	32-45	B_3	91	28									100	99	97	96	93	92	82	65	53	68	34	A-7-5(20)	MH-CH
		S31014	45+	C	93	28										100	98	97	93	92	84	65	54	66	30	A-7-5(20)	MH
Dickson silt loam:																											
1.5 miles south of Pocahontas Cemetery on Summitville-Pocahontas Road.	Thin mantle of loesslike silt over cherty limestone.	S30227	1-6	A_2	110	15									100	99	97	96	90	87	65	26	17	27	6	A-4(8)	ML-CL
		S30228	11-23	B_2	114	15										100	97	96	91	88	72	32	23	31	10	A-4(8)	ML-CL
		S30229	27-48	B_m	112	16									100	99	97	97	92	88	70	34	25	35	13	A-6(9)	ML-CL
		S30230	48+	D	107	19									100	99	97	96	90	87	68	46	34	45	17	A-7-6(12)	ML-CL
9.0 miles north of Manchester on Highway 53.	Same	S31015	1-7	A_2	109	15									100	99	98	97	87	83	61	25	16	26	5	A-4(8)	ML-CL
		S31016	14-24	B_2	114	14							100	99	98	97	96	96	88	86	54	27	18	30	10	A-4(8)	CL
		S31017	28-42	B_{3m}	113	15					100	99	98	97	96	95	94	93	86	73	43	29	23	33	13	A-6(9)	CL
		S31018	42-54	B_{2b}	104	19						100	98	97	96	95	94	93	85	79	53	41	34	48	24	A-7-6(15)	CL
Greendale silt loam:																											
3.6 miles south of Pocahontas on Pocahontas Manchester Road.	Colluvium and alluvium underlain by cherty limestone.	S30231	0-11		101	19									100	99	98	97	93	91	73	33	22	34	10	A-4(8)	ML-CL
		S30232	11-22		110	16									100	99	98	98	94	90	72	36	25	33	12	A-6(9)	CL
1.2 miles north of Ninth Modal School	Same	S31019	0-14		108	16	3	2	97		95	94	92	92	92	91	89	88	86	82	58	26	16	29	7	A-4(8)	ML-CL
		S31020	14-28		112	16					100	98	97	96	95	93	90	89	86	84	71	35	24	32	11	A-6(8)	CL
Guthrie silt loam:																											
2.0 miles east of Belmont	Thin layer of loesslike silt over cherty limestone.	S30243	5-28	B_g	115	15									100	99	98	97	87	81	59	30	22	28	10	A-4(8)	CL
		S30244	28-60+	C	116	14							100	98	97	97	96	94	84	78	58	27	21	29	11	A-6(8)	CL
9.2 miles north of Manchester on State Highway 53.	Same	S31032	6-32	B_2	113	14										100	99	98	89	86	55	31	22	27	8	A-4(8)	CL
		S31033	32-52	B_{3m}	102	20											100	99	94	90	72	52	40	50	25	A-7-6(16)	CL
Holston loam:																											
1.0 mile south of Ragsdale	Alluvium underlain by sandstone and some limestone.	S30238	1-8	A_2	112	13									100	99	98	93	71	65	46	22	15	22	3	A-4(7)	ML
		S30239	11-36	B_2	118	14									100	99	97	93	74	69	53	32	20	26	8	A-4(8)	CL
		S30240	36+	C	116	14						100	98	97	96	95	92	87	66	62	46	28	22	31	13	A-6(7)	CL
Across road from cemetery that is 6.0 miles south of Manchester Fairgrounds.	Same	S31027	0-8	A_p	112	12					100	99	98	98	98	97	95	90	70	63	44	16	9	NP	NP [6]	A-4(7)	ML
		S31028	14-28	B_2	117	13								100	99	97	95	91	76	72	52	27	19	27	10	A-4(8)	CL
		S31029	34+	C	104	20									100	99	98	92	72	69	57	43	40	48	22	A-7-6(14)	ML-CL
Huntington silt loam:																											
3.0 miles west of Noah	Alluvium underlain by limestone.	S30241	0-12		104	19												100	98	93	72	34	24	35	11	A-6(8)	ML-CL
		S30242	12-30		106	19										100	99	98	95	93	72	40	29	39	16	A-6(10)	CL
Huntington silt loam, phosphatic phase:																											
6.5 miles southwest of Manchester	Alluvium underlain by phosphatic limestone.	S31030	0-14		107	17										100	98	94	81	75	57	35	26	32	10	A-4(8)	ML-CL
		S31031	14-30		110	16										100	95	85	66	62	47	32	24	30	11	A-6(7)	CL
Lawrence silt loam:																											
6.5 miles northeast of Manchester, or 2.5 miles west of Summitville.	Thin layer of loesslike silt over cherty limestone.	S31034	4-7	A_2	113	13								100	98	96	94	93	83	77	53	20	12	22	4	A-4(8)	ML-CL
		S31035	12-23	B_2	117	14							100	98	92	86	83	82	75	71	52	26	16	29	10	A-4(6)	CL
		S31036	23-42	B_{3m}	120	12							100	96	90	84	79	78	70	66	46	20	12	24	6	A-4(7)	ML-CL
		S31037	42+	B_b	120	12	3	22	97			58	56	49	44	41	39	38	35	33	22	10	6	23	6	A-4(0)	GM-GC
9.2 miles north of Manchester on Highway 53.	Same	S31038	4-10	A_3	110	15											100	99	94	92	87	29	18	27	6	A-4(8)	ML-CL
		S31039	14-26	B_2	110	16												100	96	92	72	37	25	33	13	A-6(9)	CL
		S31040	26-49	B_{3m}	111	17												100	96	94	74	38	25	33	12	A-6(9)	CL
		S31041	49+	C_m	105	20											100	99	94	90	73	50	37	43	19	A-7-6(12)	CL
Lobelville silt loam:																											
7.0 miles north of Manchester on Highway 53.	Alluvium underlain by limestone.	S31042	0-12		107	16							100	99	97	94	92	91	79	73	55	31	21	30	8	A-4(8)	ML-CL
		S31043	16-30		114	14					100	98	96	94	90	86	82	79	66	61	46	25	19	27	8	A-4(6)	CL
7.5 miles northeast of Manchester on Ragsdale Road.	Same	S31044	0-14		113	14								100	99	98	97	96	89	81	52	28	21	24	6	A-4(8)	ML-CL
		S31045	14-26		117	14							100	99	97	92	88	87	82	78	61	34	22	29	11	A-6(8)	CL
Mountview silt loam:																											
1.5 miles east of Antioch Church	Thin mantle of loesslike silt over cherty limestone.	S30218	1-8	A_2	107	16										100	97	96	93	91	65	28	17	26	4	A-4(8)	ML-CL
		S30219	10-29	B_2	110	17										100	98	97	95	93	75	39	28	41	18	A-7-6(11)	CL
		S30220	34+	D	100	23										100	99	99	97	93	80	55	47	57	25	A-7-5(17)	MH
6.0 miles south of Manchester	Same	S31004	2-9	A_2	114	13									100	99	98	97	86	81	52	22	14	20	2	A-4(8)	ML
		S31005	15-30	B_2	115	15								100	99	98	97	96	88	82	63	30	23	33	13	A-6(9)	CL
		S31006	30-42	B_3	110	17									100	99	98	97	88	83	68	37	32	40	19	A-6(12)	CL
		S31007	42-54	B_{2b}	108	18								100	98	96	94	92	80	74	59	38	32	45	21	A-7-6(13)	CL
Sango silt loam:																											
2.0 miles north of Manchester	Same	S31046	3-10	A_3	111	14									100	99	97	96	88	85	60	28	16	25	6	A-4(8)	ML-CL
		S31047	15-32	B_2	113	14								100	99	98	94	93	86	81	63	28	20	30	9	A-4(8)	ML-CL
		S31048	32-48	B_{3m}	112	14								100	99	98	96	95	89	85	66	29	19	30	10	A-4(8)	CL
		S31049	48+	B_{3b}	108	18									100	99	97	96	90	86	69	39	28	42	18	A-7-6(12)	ML-CL
6.5 miles northeast of Manchester	Same	S31050	3-9	A_3	116	13								100	98	96	94	93	82	77	53	22	14	23	5	A-4(8)	ML-CL
		S31051	15-24	B_2	115	13							100	99	97	95	93	92	83	79	59	26	18	27	8	A-4(8)	CL
		S31052	24-38	B_{3m1}	120	12							100	97	92	87	84	83	75	70	50	21	13	23	5	A-4(8)	ML-CL
		S31053	38-52	B_{3m2}	122	11							100	97	90	83	78	77	70	66	47	21	12	21	5	A-4(7)	ML-CL

[1] Tests performed by the Bureau of Public Roads in accordance with standard procedures of the American Association of State Highway Officials (A. A. S. H. O.).

[2] Mechanical analyses according to the American Association of State Highway Officials Designation T 88. Results by this procedure frequently may differ somewhat from results that would have been obtained by the soil survey procedure of the Soil Conservation Service (SCS). In the A. A. S. H. O. procedure, the fine material is analyzed by the hydrometer method and the various grain-size fractions are calculated on the basis of all the material, including that coarser than 2 mm. in diameter. In the SCS soil survey procedure, the fine material is analyzed by the pipette method and the material coarser than 2 mm. in diameter is excluded from calculations of grain-size fractions. The mechanical analyses used in this table are not suitable for use in naming texture classes for soils.

[3] Based on total material. Laboratory test data corrected for amount discarded in field sampling.

[4] Based on Standard Specifications for Highway Materials and Methods of Sampling and Testing (Pt. 1, Ed. 7): The Classification of Soils and Soil-Aggregate Mixtures for Highway Construction Purposes, A. A. S. H. O. Designation M 145-49 (*1*).

[5] Based on the Unified Soil Classification System, Technical Memorandum No. 3-357, Volume 1, Waterways Experiment Station, Corps of Engineers, March 1953 (*12*).

[6] NP=Nonplastic.

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