

SOIL SURVEY

Decatur County Tennessee

Series 1941, No. 12



Issued January 1955

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

How to Use THE SOIL SURVEY REPORT

FARMERS who have worked with their soils for a long time know about soil differences on their own farms, and perhaps about differences among soils on farms owned by their immediate neighbors. What they do not know, unless soil surveys have been made, is how nearly their soils are like those on experiment stations or other farms, either in their State or other States, on which new or different farming practices or enterprises are in operation. Farmers of Decatur County can avoid some of the risk and uncertainty involved in trying new crops and soil management practices by using this soil survey report, for it gives them an opportunity to compare their own soils with soils on which new developments have proved successful.

SOILS OF A PARTICULAR FARM

The soils of Decatur County are shown on the soil map that accompanies this report. A mile on the ground equals 2.64 inches on this map. To learn what soils are on a particular farm or tract of land, first locate the boundaries of the farm or tract on the map by referring to roads, streams, villages, dwellings, and other landmarks. The next step is to identify the soils on the farm or tract. Each area of each kind of soil is shown on the map with a symbol and distinguishing color. The map legend gives the name of each soil and the symbol and color used on the map to identify that soil. For example, all areas on the map marked with the symbol H₂ are Humphreys silt loam, and all areas so marked are the same color, wherever they appear on the map.

If you wish to know what Humphreys silt loam is like, for what it is used, and to what uses it is suited, turn to the section on Description of the Soils. Refer also to the section Soil Use and Management, where soils requiring about the same management are placed in groups and suitable farming practices are suggested for each group. If you desire to know how productive the soil is, consult table 6. You will

find the name Humphreys silt loam in the left-hand column of table 6, and in columns following you can read the yields of different crops this soil can be expected to produce. You can compare these yields with those given in the table for other soils mapped in the county.

SOILS OF THE AREA AS A WHOLE

A general idea of the soils in the county is given in the section Soil Series and Their Relations, which tells about the principal kinds of soils, where they are found, and how they are related to one another. After reading this section study the soil map and notice how the different kinds of soils are grouped according to colors. These groupings correspond with the management groupings given in the section on Soil Use and Management; that is, all soils suited to the same general use and management are shown in various shades of one color. These groupings reflect well-recognized differences in types of farming, land use, and land use problems.

A newcomer to the county, especially if he considers purchasing a farm, will want to know about the climate; the types and sizes of farms; the principal farm products and how they are marketed; the kinds and conditions of farm tenure, including tenancy; the kinds of farm equipment; the availability of churches, roads, schools, railroads, telephone and electric services, and water supplies; the industries of the county; and the cities, villages, and population characteristics. Information about all these will be found in the section on General Nature of the Area or in the section on Agriculture.

Those interested in how the soils of the county were formed and how they are related to the great soil groups of the world should read the section on Morphology and Genesis of Soils.

This publication on the soil survey of Decatur County, Tenn., is a cooperative contribution from the—

SOIL CONSERVATION SERVICE
the
TENNESSEE AGRICULTURAL EXPERIMENT STATION
and the
TENNESSEE VALLEY AUTHORITY

SOIL SURVEY OF DECATUR COUNTY, TENNESSEE

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

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¹ In charge of field work until most of the county was surveyed.

² The Division of Soil Survey was transferred to the Soil Conservation Service on November 15, 1952.

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FROM the days of earliest settlement, Decatur County has been primarily a farming-forestry area. The temperate climate favors production of crops, but much of the county is so hilly or steep that it can be used only for grazing or forestry. The crop-adapted soils respond to good management but their acreage on each farm is generally small. This cooperative soil survey was made by the United States Department of Agriculture, the Tennessee Agricultural Experiment Station, and the Tennessee Valley Authority to provide a basis for determining the best use of farm lands and the forested areas now greatly depleted by overcutting and fires. Field work for this survey was completed in 1941. Unless otherwise specifically indicated, all statements in this report refer to conditions in the county at that time.

GENERAL NATURE OF THE AREA

LOCATION AND EXTENT

Decatur County is in western Tennessee (fig. 1). Benton County adjoins it on the north, Hardin County on the south, and Henderson

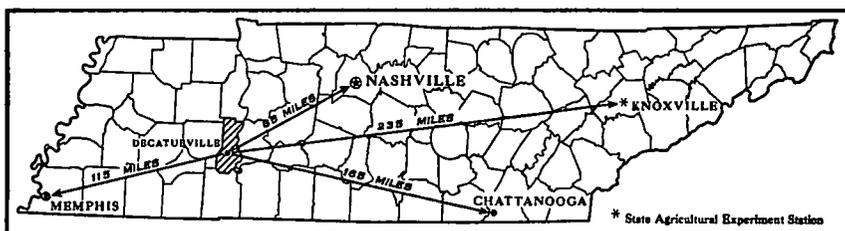


FIGURE 1.—Location of Decatur County in Tennessee.

and Carroll Counties on the west. The Tennessee River separates it from Perry and Wayne Counties on the east and flows along a part of the south side. Decaturville is 85 miles southwest of Nashville and 115 miles northeast of Memphis. The total land area is approximately 330 square miles, or 211,200 acres; an additional 6,542 acres is inundated by the Kentucky Reservoir.

PHYSIOGRAPHY, DRAINAGE, AND RELIEF

Physiography.—Decatur County is on the boundary between the Coastal Plain province and the Interior Low Plateaus province. About 49 percent of the county is in the East Gulf Coastal Plain section of the Coastal Plain province, and the rest, or about 51 percent, is in the Highland Rim section of the Interior Low Plateaus province. The boundary between these two major physiographic divisions is only a rough generalization, for ragged remains of Cretaceous (Coastal Plain) sand cap the high ridges in practically all parts of the Highland Rim section (6)² (pl. 1, A).

The rock formations exposed in the Coastal Plain province all consist of loose unconsolidated sediments. In the Highland Rim section of the Interior Low Plateaus province, limestone, chert, and shale are abundant. A thin layer of wind-blown silt lies on most areas of mild relief, and large areas of old and recent alluvium occur along all major streams. Most of the formations are relatively thin. The rocks have faulted and folded to some extent, but in most places the strata deviate very little from the horizontal.

Differences in the bedrock are reflected in differences in relief, drainage, and soils. The main physiographic divisions in the county are (1) Coastal Plain, (2) Loess Plain, (3) Limestone Hills, (4) river flood plains, and (5) stream terraces (fig. 2). These divisions are explained in numbered sections following.

1. The Coastal Plain section of the county is highly dissected and characterized by sharp ridges and narrow crooked valleys. The relief ranges from about 50 to 100 feet. Much of the area is underlain by unconsolidated material ranging from loose gravel and sand

² Italic numbers in parentheses refer to Literature Cited, p. 220.

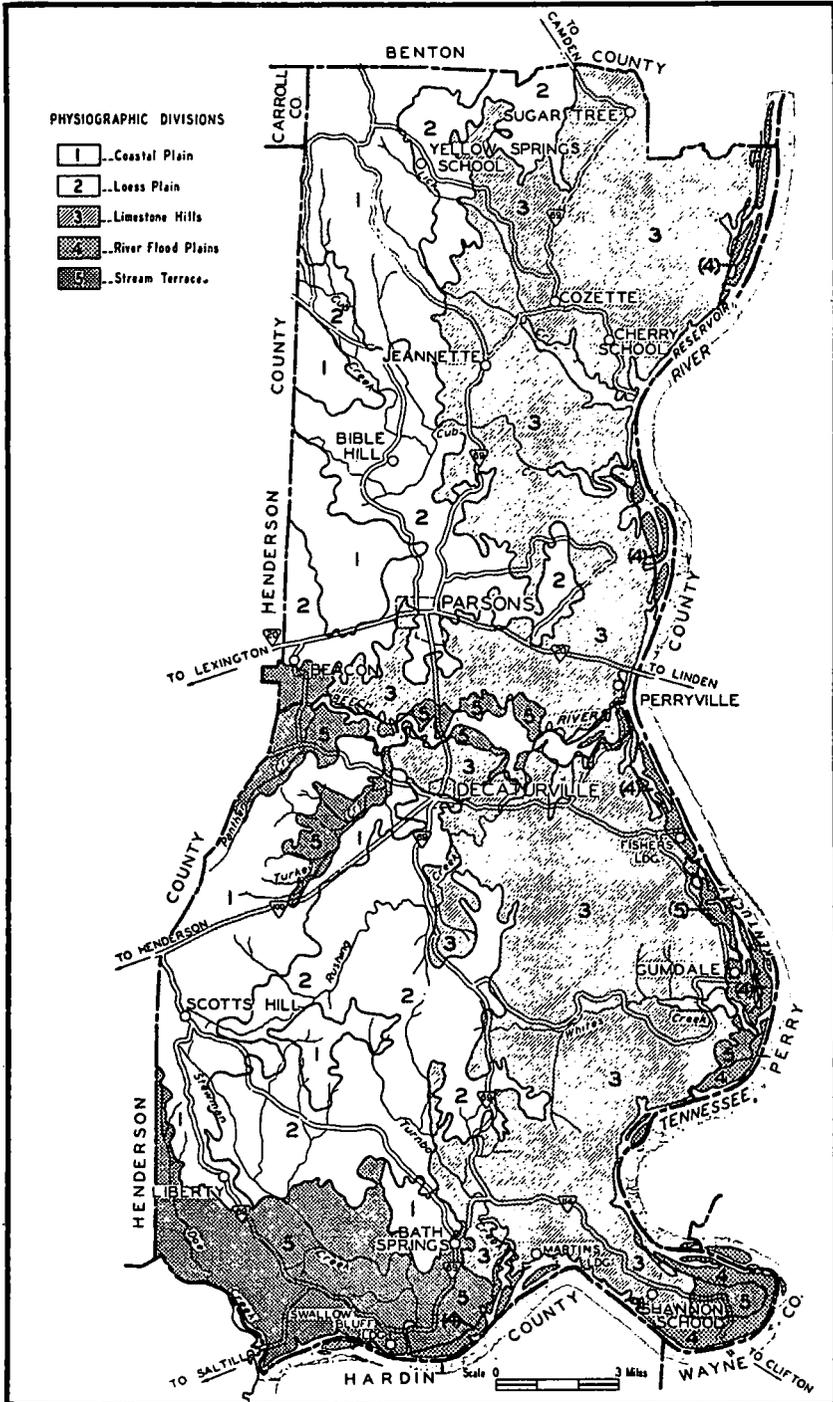


FIGURE 2.—Physiographic divisions of Decatur County, Tenn.

to heavy clay. Most of this section is underlain by the red micaceous sand of the Eutaw formation. In most places this formation consists of layers of sand and thin layers of clay. A bed of black lignitic clay, 10 to 15 feet thick, is at the base of this formation in many places. Gravel lenses with pebbles of chert and some quartz are present in places. The extreme northwestern part of the area is underlain by glauconitic and micaceous sands and clays of the Ripley formation (12).

2. The Loess Plain section is an area of mild relief in the central part of the county. It is very irregular in shape and occupies the least dissected part of the uplands. The relief ranges from about 20 to 50 feet. A thin layer of loess covers most of this area to a maximum depth of about 4 feet. This silt, predominantly gray, is underlain by unconsolidated sand and clay in most places, but a part is underlain by cherty limestone.

3. The Limestone Hills section is highly dissected and consists of alternate parallel ridges and deeply cut V-shaped valleys. The relief ranges from less than 100 feet in the upper stream valleys to about 150 feet in the lower valleys near the river. This section is underlain primarily by cherty limestone, though high-grade limestone outcrops in many of the valleys (pl. 1, B). Several formations are represented.

The Hermitage, the oldest formation exposed in the county, occurs in this section. The area of it exposed is small and consists of alternating beds of dense blue phosphatic limestone and dark-colored fissile shale (3). Dixon limestone is widely distributed throughout the southeastern part of this section and along most of the stream valleys. It is an argillaceous limestone ranging from greenish gray to dark red. Outcrops of the Beech River limestone are conspicuous but not extensive. This formation consists of gray shaly limestone and gray or greenish clay and shale. The outcrops of this formation are marked by barren patches of light-gray clay and limestone rubble upon which little grows except cedar.

Most of the Limestone Hills section is underlain by the Fort Payne and Harriman chert formations. These formations are similar in appearance and consist primarily of dense to porous chert beds interbedded with tripoli and siltstone of similar thickness (5). The formations are separated by thin beds of black shale of the Chattanooga shale formation.

4. The Tennessee River flood plains have a maximum width of about 1 mile. The first bottoms are gently undulating and consist of a natural levee near the river and low ridges and intervening swales or sloughs that run nearly parallel with the river. The flood plain is 10 to 25 feet above the normal river level and is subject to overflow. The low terraces that lie 5 to 20 feet above the general level of the flood plain are in this area. The area is underlain by general alluvium washed from a wide variety of materials; it consists of a mixture of materials from limestone, sandstone, shale, Coastal Plain sand and clay, and loess.

5. Extensive high terraces occur along the Tennessee and Beech Rivers. The largest areas are in the extreme southern part of the county. These terraces range from about 25 to as much as 100 feet above the present flood plains. They are moderately dissected and are characterized by relatively broad level ridge crests and short steep

ridge slopes. The relief ranges from 25 to 75 feet. In most places the terraces are covered by a thin layer of loess.

Drainage.—Decatur County is drained by the Tennessee River and its many tributaries. The Tennessee River flows from south to north along the eastern boundary; most of its tributaries flow in an easterly direction. The Beech River flows west to east through the central part of the county and drains much of this part. Other important streams are Doe, Whites, Rushing, Cub, and Morgan Creeks. All of the county has a fairly well developed dendritic drainage pattern.

Relief.—The uplands in Decatur County range in elevation from about 450 to 550 feet. The bottom land along the Tennessee River and near the outlets of larger streams ranges from 355 to 385 feet. At Decaturville the elevation is 517 feet; at Perryville, 374 feet; at Bath Spring School, 388 feet.³ The normal water level in the Kentucky Reservoir is 359 feet.

CLIMATE

The climate of Decatur County is temperate and continental. The winters, relatively short and mild, are characterized by alternate short cold snaps and milder temperatures of somewhat long duration. Climatic data presented in table 1—collected at the Perryville weather station 6 miles east of Parsons on the bank of the Tennessee River—are considered fairly representative for the county, since local variations in temperature and rainfall are slight or nonexistent.

The mean temperature is 60.1° F. Summers are fairly warm, with a mean temperature of 78.1°. The mean annual precipitation of 51.49 inches includes 6.7 inches of snow.

Variation in temperature between seasons is not great. The spread between mean winter and mean summer temperature is only 37° F. Extremes in temperatures are to be expected, but not frequently. The lowest January temperature recorded at the Perryville station is -10°; the highest in summer is 113°. Temperatures below zero are as unusual as those above 102°. Temperatures above 102° occur on the average once in 5 years; those below zero, once in 10 years. Temperatures above and below the normal high and low are to be expected at much shorter intervals. About 2 out of every 4 years a low of 5° is recorded, and for a few days in almost every year the temperature reaches 100° to 102°.

Because of relatively mild open winters and few severe heat waves in summer, farming operations can be carried on throughout most of the year. Temperatures are relatively favorable for winter crops, especially winter annuals. Few freezes are severe enough to damage any crops except those on the poorly drained or heavy-textured soils. Frost heaving damages crops on the poorly drained or heavy-textured soils.

The average frost-free period of 192 days extends from April 11 to October 21. The latest killing frost recorded occurred on May 10, the earliest, on September 22. These dates are the extremes; such unseasonable frosts do not occur often. Frosts in September are extremely rare, but a frost in early May comes about once every 5

³ Elevations from United States Geological Survey planimetric maps.

years. Frosts late in spring seldom damage corn and cotton, the principal row crops; but lespedeza, the principal hay and pasture crop, and fruits are frequently damaged. Corn and cotton are usually so near maturity by September 15 that they are not damaged by frosts. Nevertheless, corn planted on some of the poorly drained soils may not mature before early frosts.

TABLE 1.—Normal monthly, seasonal, and annual temperature and precipitation at Perryville, Decatur County, Tenn.

[Elevation, 430 feet]

Month	Temperature			Precipitation			
	Mean	Absolute maximum	Absolute minimum	Mean	Total for the driest year	Total for the wettest year	Average snow-fall
	°F.	°F.	°F.	Inches	Inches	Inches	Inches
December.....	41. 2	75	—3	5. 32	2. 45	3. 64	2. 0
January.....	40. 2	77	—10	5. 16	2. 64	6. 11	1. 4
February.....	42. 0	78	—3	4. 13	1. 26	3. 23	2. 2
Winter.....	41. 1	78	—10	14. 61	6. 35	12. 98	5. 6
March.....	51. 4	91	13	5. 50	1. 53	12. 19	. 8
April.....	59. 4	92	23	4. 68	2. 38	4. 75	(¹)
May.....	68. 1	99	35	4. 23	1. 10	5. 20	0
Spring.....	59. 6	99	13	14. 41	5. 01	22. 14	. 8
June.....	75. 9	106	41	4. 23	1. 41	3. 95	0
July.....	79. 6	113	48	3. 99	6. 76	1. 33	0
August.....	78. 9	113	48	3. 96	4. 43	7. 90	0
Summer.....	78. 1	113	41	12. 18	12. 60	13. 18	0
September.....	73. 2	111	32	3. 09	. 13	. 80	0
October.....	61. 0	97	23	3. 42	3. 50	9. 94	(¹)
November.....	49. 9	87	8	3. 78	3. 15	12. 41	. 3
Fall.....	61. 4	111	8	10. 29	6. 78	23. 15	. 3
Year.....	60. 1	113	—10	51. 49	² 30. 74	³ 71. 45	6. 7

¹ Trace.

² In 1941.

³ In 1919.

The average annual precipitation of 51.49 inches is relatively evenly distributed. The average rainfall is 14.61 inches in winter, 14.41 inches in spring, 12.18 inches in summer, and 10.29 inches in fall. Most of the precipitation comes as rain, but some snow falls in winter. Snowfalls are usually light and last only a few days. Rains during winter are usually gentle and often last several days. Flash storms occur during spring and summer but are seldom torrential.

Severely damaging droughts are not common, but crops on certain soil types will be somewhat damaged by lack of rain almost every year. Crops on Egam soils, for example, are extremely susceptible to

drought. Crops on the heavy-textured upland soils, as Cuthbert and Talbott, are also susceptible. Long dry spells are extremely damaging to crops on the poorly and imperfectly drained soils, as the Almo, Hatchie, Robertsville, and Taft, that have silt pans or clay pans, but crops on such soils are not much damaged during short dry spells. Droughts during the fall seeding period are very damaging to winter cover crops. They kill out part of the stand and also delay growth until the young plants are killed by winter freezes.

The soil type is often as important as the quantity of precipitation in determining the effect of drought. Soils with internal and external characteristics that do not favor a large water-holding capacity are much more subject to drought than those that have characteristics favoring a large water-holding capacity.

Wet periods long enough to interfere seriously with farm operations occur frequently in spring. Crops on well-drained soils of the uplands and high terraces are more damaged by delayed seeding than by reduction in yields that result directly from the wet spells. On poorly and intermediately drained soils wet periods may delay seeding so much that yields are much lowered. After crops are up and growing they are seldom damaged by extended wet spells, except where they are on very poorly drained soils or on soils that have sluggish surface drainage. The periods of excessive rainfall, however, tend to increase the cost of producing the crop by encouraging weed growth.

Mild southwesterly winds are frequent during March and April. In summer and fall there are a few mild breezes. Cold north winds are common during winter but seldom reach a velocity that does any great damage. Tornadoes are extremely rare. Hailstorms accompanied by high winds occur at relatively long intervals. Hailstorms usually come early in spring and often damage crops and property.

WATER SUPPLY

Most sections of the county are amply supplied with water the year round. Streams in the Limestone Hills section, however, usually go dry during summer and fall. Springs are numerous in this section, but the water flows beneath the gravel in the stream beds in most places. Water can be obtained from shallow wells in the valleys at all times. Farmers who live on the ridges in this area depend chiefly on cisterns for their water supply.

On the Loess Plain moderately deep wells furnish water for home use, and artificial ponds supply water for livestock. In the rest of the county springs or wells supply enough water for household use and permanent streams furnish water for livestock. The Tennessee River offers opportunities for swimming, boating, and fishing; the larger creeks afford swimming and fishing.

VEGETATION

The first settlers found the area now in Decatur County densely wooded (13). Even today about 57 percent of the county is in deciduous forest. The principal species are post, black, blackjack, white, chestnut, pin, and Spanish or scarlet oaks, redcedar, cypress, hickory, hornbeam, elm, hackberry, yellow-poplar, sassafras, sweet-

gum, sycamore, locust, red maple, redbud, ash, and persimmon (? , 11). A considerable number of cedar trees and some pine trees grow in the southern part of the county. Practically all of the forest has been cut over one or more times. A much more detailed discussion of forests will be found in the section on Forests.

ORGANIZATION AND POPULATION

After the Chickasaw cession of 1818, settlers began to arrive in what is now Decatur County. A few hunters and trappers entered before that time, but hostile Indians prevented permanent settlement.

In the early years of the settlement pioneers arrived in great numbers. They came chiefly from middle and east Tennessee, but many came from North Carolina, and a few came from Virginia and South Carolina.

Decatur County was originally a part of Perry County, which was established in 1821. When flooded, the Tennessee River prevented people living on the east side of the river from reaching the county seat of Perry County, which was then at Perryville. In 1845 Decatur County was formed from part of Perry County and its county seat was established at Decaturville (9).

The population of the county was 9,442 in 1950. Decaturville and Parsons are the two largest towns and the chief trading centers. Scotts Hill, Sugar Tree, and Perryville are small villages. Perryville was once a flourishing town but it ceased to grow after the county seat was moved to Decaturville.

INDUSTRIES

Decatur County is an agricultural region but there are a few industries, of which lumbering is one of the more important. A number of sawmills produce lumber, cross ties, and fence posts. A small garment factory in Parsons employs local residents, and cotton gins afford some employment during the ginning season.

Many farmers in Decatur County operate on a subsistence basis. They raise food for the family and animals and do part-time work during off seasons. Many make and market cross ties from timber on their own place or work timber on shares. Others work part time at sawmills, lime crushers (pl. 2, A), and cotton gins. A few supplement farm income by fishing or digging mussels on the Tennessee River.

TRANSPORTATION

Nearly all transportation in the county is by highway. Good county-maintained gravel roads reach every part of the county. There are, in addition, four State highways. Highway No. 20 is a paved road crossing the county from east to west. Highway No. 69, gravel-surfaced except for 5 miles between Parsons and Decaturville, crosses the county from north to south. Highway No. 100, a good straight gravel road, runs southwest from Decaturville through Scotts Hill. Highway No. 114 is a gravel road running from the Tennessee River opposite Clifton in Wayne County to the junction with highway No. 69 at Bath Springs. In 1950, 90 farms reported being on a hard surface road; 1,094 farms on a gravel, shell, or shale road; and 65 farms on a dirt or unimproved road.

At present Decatur County does not have a railroad. The Tennessee Midland Railroad Company built a line from Lexington, in Henderson County, to Perryville in 1889. The Nashville, Chattanooga & St. Louis Railroad took over the line as soon as it was completed and operated it until 1936, when service was discontinued.

The Tennessee River was once the most important avenue of transportation. Steamboats moved most of the farm produce and livestock to market and brought in needed supplies. Now river transportation is not nearly so important, though large quantities of cross ties are still shipped by barge, and one oil company still transports fuel in that way.

SCHOOLS, CHURCHES, AND HOME IMPROVEMENTS

Many pupils in Decatur County still get their elementary education in one-room schools, but the school system has been greatly improved in recent years by consolidations. In 1941 the county had 49 elementary schools and 3 high schools. Of this number 35 were one-teacher schools; 9, two-teacher schools; and 5 consolidated elementary schools having three or more teachers.⁴ Churches are numerous.

Telephone services are available throughout much of the county, but in 1950 only 447 farm homes or country stores had telephones. Rural sections generally do not have electric power facilities. In 1950, 688 farm homes were lighted by electricity.

The open-hall farmhouse is still common in Decatur County. Most farmhouses are in poor repair, and outbuildings are generally poorly constructed and not well maintained. Not many livestock are raised, so there is not much need for large barns. Many of the farms do not have enough barn space for the work stock. The size of dwellings and outbuildings and their general state of repair are very closely correlated with the productivity of the soils and the area of land on the farm that can be cultivated.

AGRICULTURE

Before 1818 the part of western Tennessee that later became Decatur County was claimed by the Chickasaw Indians, who lived in villages on the bluffs overlooking the Mississippi River. These Indians evidently did not use the land to any great extent for agriculture, but rather for hunting and fishing (13).

Most of the early settlers came down the Tennessee River by boat. The river was the principal means of transportation, and the important early settlements were river landings. Perryville was the most important of these.

The story of the agriculture in western Tennessee is largely that of corn and cotton, the chief staples. The early settlers farmed almost entirely on a subsistence basis. They raised corn and the other food and feed crops, their prime necessities, and some cotton for home use. The production of cotton for market began soon. As early as 1821 cotton was being grown in the neighboring county of Madison. Writing in 1873, Killebrew states that the chief farm products were cotton, corn, and wheat, but that some grass crops and root crops were grown

⁴ Information obtained from the superintendent of county schools.

(9). At this time only 41,205 acres out of a total of 322,690 acres was improved land.

Early settlers grew tobacco first for home use and later for market. Because of the demand in the early 1870's, however, peanuts almost entirely displaced tobacco. In 1879 about half the cultivated land was planted to corn, about one-fourth to small grain, principally wheat, and about one-fourth chiefly to cotton. Some tobacco and peanuts were also raised at that time.

Available records show that the farmers paid little attention to the use suitability of the land and that they did not attempt to maintain the fertility of the soils.

Lack of transportation and markets forced the early settlers to be subsistence farmers. After steamboats began to run, farmers were able to send surplus livestock and produce to Louisville, Cincinnati, Evansville, St. Louis, and other distant markets. The early roads were very poor; transportation to overland markets was slow and costly. The railroad built in 1889 opened the way to new markets and definitely affected the agriculture of the county. Improved transportation made markets available, and as a result more cash crops and fewer subsistence crops were grown. Wheat and other small grain crops decreased, and cotton and peanuts became more important.

CROPS

Many different kinds of crops are grown in the county. Corn and cotton are the principal field crops. Corn is grown chiefly as a feed crop, and cotton strictly as a cash crop. Lespedeza and redtop, the important hay and pasture crops, are supplemented with soybeans, cowpeas, hop clover, white clover, Bermuda grass, alfalfa, bluegrass, and red clover. Ryegrass, crimson clover, Austrian peas, vetch, oats, rye, and wheat are grown to a limited extent, chiefly as winter cover crops and for early spring pasture. Other crops are peanuts, sorghum, potatoes, sweetpotatoes, broomcorn, and tobacco. Most farmers also grow a variety of vegetables and fruits for home use. Acreages of principal crops are given in table 2 for stated years.

Corn and cotton are grown on approximately half of the cropland. About 2 acres of corn are planted for each acre of cotton. The corn acreage has fluctuated slightly from one decade to another. The total acreage in hay, oats, rye, wheat, sorghum, tobacco, potatoes, sweetpotatoes, broomcorn, peanuts, or soybeans has been small compared with the total acreage planted to either corn or cotton. In the period 1919-50 there was a gradual decrease in the total acreage of oats and wheat but no significant change in the total acreage of peanuts and hay.

CORN

Corn is the crop most widely grown in the county. The average yield has been about 22 bushels an acre.

Corn is well adapted to many soils of the county, though yields on different soils vary. It is grown to some extent on almost every soil type. Corn is especially well adapted to Huntington, Ennis, Shannon, Lindside, Hymon, and other soils of the bottom lands and to the soils of colluvial lands such as the Emory, Greendale, Briensburg, and Tigrett. The highest yields are usually obtained on these soils. Corn is moderately well suited to Egam, Wolftever, Taft, Greendale, Eto-

TABLE 2.—*Acreage of the principal crops and number of fruit trees in stated years in Decatur County, Tenn.*

Crop	1919	1929	1939	1949
	<i>Acres</i>	<i>Acres</i>	<i>Acres</i>	<i>Acres</i>
Cotton.....	8, 539	12, 409	6, 698	8, 531
Corn.....	28, 484	23, 528	21, 110	17, 144
Oats.....	97	(¹)	(¹)	9
Wheat.....	196	(¹)	(¹)	8
Dry edible beans.....	18	1, 309	² 2, 098	¹ 1, 651
Peanuts.....	600	1, 536	532	314
Potatoes.....	162	197	214	³ 42
Sweetpotatoes and yams.....	163	153	161	³ 23
All hay.....	7, 191	4, 430	8, 134	6, 091
Timothy and clover, alone or mixed.....	1, 235	1, 361	498	159
Alfalfa.....	20	19	53	214
Grains cut green.....	1, 287	52	(¹)	22
Legumes cut for hay.....	2, 754	2, 519	1, 758	(¹)
Lespedeza.....	(¹)	(¹)	5, 719	5, 576
Other cultivated grasses.....	1, 752	412	54	120
Wild, salt, or prairie grasses.....	143	121	52	(¹)
Sorghum cane (for sirup).....	258	224	211	(¹)
	<i>Number</i>	<i>Number</i>	<i>Number</i>	<i>Number</i>
Apple..... trees.....	9, 491	6, 131	5, 089	5, 286
Peach..... do.....	22, 042	12, 533	13, 924	8, 995

¹ None reported.

² Soybeans.

³ Does not include acres for farms with less than 15 bushels harvested.

wah, Maury, and similar soils, but it is poorly suited to Cuthbert, Luverne, Talbott, Bodine, Melvin, Robertsville, and Beechy soils, on which it usually produces low yields. If Melvin and Beechy soils are drained by artificial means and the seasons are favorable, a fairly good yield of corn may be expected.

Corn is grown chiefly as a feed crop. Most of it is consumed by cattle, hogs, and workstock on the farm where it is produced. It is also important in the diet of the average farm family, as it supplies roasting ears, hominy, and cornmeal for bread. Some corn is sold or traded to nearby farmers. Recently tractors have partly replaced workstock, so more corn has been sold than previously. In the future corn may become a cash crop for some farmers.

COTTON

Cotton has been one of the principal crops in the county since 1919. It is grown in all parts of the county and on nearly every farm. The best cotton is grown on soils of the uplands and high terraces such as the Dulac, Savannah, Dickson, Freeland, Pickwick, and Paden. Probably 60 percent of the cotton is grown on soils that have a siltpan. Cotton is suited to a wide range of soils but produces higher yields on well-drained upland and terrace soils.

Cotton is usually picked during September and October and carried to the local cotton gin, where it is ginned and baled or sold in the seed to the owner of the gin. Cotton is the only important cash crop in the county.

PEANUTS

Peanuts were an important cash crop in the northeastern part of the county for many years, but the acreage has decreased greatly. Peanuts are grown chiefly on colluvial soils, soils on low terraces, and soils on bottoms. Probably more than half of the acreage is on soils of the Humphreys series. Peanuts are grown to some extent for home use, but in the Limestone Hills section they are a cash crop.

Peanuts are harvested and stacked in October, allowed to cure for 2 to 3 weeks, and then picked and graded. They are sold to buyers from outside the county. A small part of the crop is consumed at home.

HAY

Hay crops consist mostly of lespedeza, redbud, soybeans, and peas, though some wild grasses are cut. The average yield for the various hay crops is approximately 1 ton an acre. There has been little change in the acre yields of hay crops from 1919 to 1950.

Hay crops are grown to some extent on most of the tillable soils. On the bottom lands hay is grown chiefly on imperfectly and poorly drained soils. On terraces and uplands it is grown in irregular rotations with other crops such as cotton and corn.

Practically all the hay is fed on the farm to workstock and beef and dairy cattle. Only small quantities are traded or sold to nearby farmers.

MINOR CROPS

Minor crops are oats, rye, wheat, sorghum, tobacco, potatoes, sweetpotatoes, watermelons, broomcorn, and various vegetables and fruits. The vegetables most commonly grown are cabbage, onions, beans, peas, tomatoes, squash, peppers, okra, turnips, mustard greens, spinach, radishes, lettuce, eggplant, cucumbers, and carrots. Apples, peaches, plums, pears, grapes, blackberries, dewberries, and raspberries are the most commonly grown fruits. Some farmers grow sweetpotatoes, sorghum, and oats, but only a few grow wheat, rye, tobacco, and broomcorn.

Most of the sorghum cane is made into sirup, which is consumed on the farm or sold locally. Oats, wheat, and rye are grown to small extent as winter cover crops. Potatoes, sweetpotatoes, watermelons, vegetables, and fruits are grown for home use, though surplus watermelons and potatoes are sold to local retailers. Tobacco is grown only for home use. Excepting white potatoes, sweetpotatoes, and sorghum, the acreage of the crops mentioned above is insignificant.

PASTURE

The pastures in the county are of two kinds—rotation and permanent. Rotation pastures are grown on soils suitable for crops and are rotated with such crops as corn and cotton. Most of the permanent pastures are on severely eroded soils, stony land, or poorly drained soils of the bottom lands and terraces.

In 1950, 18,373 acres were in cropland used only for pasture; 16,367 acres in woodland pasture, and 7,838 acres in other land pastured. The quality of the permanent pastures varies according to the soil. The range is from areas of rough gullied land supporting cedars, scrub oak, persimmon bushes, and broomsedge to productive soils that have

been fertilized and sown to lespedeza, redtop, orchard grass, white clover, and hop clover.

The area of productive soil in permanent pasture is very small. Most permanent pastures are intermediate in quality and are on gullied or stony lands or on poorly drained soils that have been seeded to lespedeza and redtop but have not received any fertilizer other than manure from the livestock.

AGRICULTURAL PRACTICES

Agricultural practices in the county vary somewhat according to differences in soil type, soil-distribution patterns, lay of the land, and size of farms. Modern machinery is generally used on the larger farms of the undulating to rolling uplands and on the river bottoms. Much of the tillage in the hilly areas and on small farms is done with one-horse or two-horse implements. The small acreage of small grain is generally harvested with combines, as are also lespedeza, crimson clover, vetch, soybeans and other legume crops when grown for seed. Cotton and corn are harvested almost entirely by hand.

Most of the small grain crops such as wheat, rye, oats, and barley are planted in fall and harvested in June or July, but a part of the oat crop is planted early in spring. Legumes such as crimson clover and vetch are sown in fall and plowed under in April or May or harvested for seed in June. Timothy and red clover are sown either in fall or spring. Corn is generally planted during April and May, though some is planted as late as June 20. Cotton is planted from May 1 to 10, and peanuts from April 20 to May 20.

Fertilizers are used on most of the cotton crop, on some hay and pasture, and most winter cover crops. Little fertilizer is used on corn and peanuts. The most commonly used fertilizers for cotton are 2-12-6,⁵ 3-9-6, 4-12-4, or 6-8-4. Some farmers use 16- or 20-percent superphosphate alone or with a side dressing of nitrogen. About 2 tons of lime and 200 pounds of triple superphosphate an acre are commonly used for cover crops. These are also the most common applications for pasture and hay crops. Manure is generally applied to the vegetable crops or truck crops.

LIVESTOCK

CATTLE

A total of 6,140 head of cattle were in the county in 1950 on the 1,057 farms reporting. Cattle are the most valuable class of livestock, exclusive of work stock. Most of the cows are grades of Jerseys, but there are a few herds of good-grade Herefords and Shorthorns. Very few purebred cattle of any breed are kept.

HOGS

In 1950 there were 12,700 hogs in the county on the 938 farms reporting. This figure represents an increase over 1940, when the total was 6,799 on 1,042 farms. The 1950 figure was still well under the 16,579 hogs reported on farms in 1920. Some of the hogs are butchered and consumed on the farm where they are raised.

⁵ Percentage of nitrogen, phosphoric acid, and potash, respectively.

POULTRY

Poultry is widely distributed in the county. Almost every farm has a small flock of chickens, but very few farms have large flocks. Only 5 farms were classed as poultry farms in 1950. In large part the poultry and poultry products are consumed on the farm where they are produced. In 1950 there were 40,862 chickens on 1,143 farms reporting.

SHEEP AND GOATS

The total number of sheep in 1950 was 182, as compared to 507 in 1940, 620 in 1930, and 1,270 in 1920. The principal breeds are South-down and Hampshire, or grades of these breeds. Few goats are raised.

WORK STOCK

In 1950, 1,717 mules and 381 horses were reported on farms. The number of horses and mules has declined since 1920, when 1,110 horses and 2,940 mules were reported. Since 1930 the decrease in work stock has probably been caused by greater use of tractors.

TYPE AND SIZE OF FARMS

The number of farms reported in the county in 1950 was 1,322. Classified by major source of income, 278 were field-crop farms, 10 dairy farms, 5 poultry farms, 216 livestock farms other than dairy and poultry, and 166 general farms. Miscellaneous and unclassified farms totalled 647.

Most of the farms contain less than 180 acres. In 1950 there were 74 farms less than 10 acres in size; 344 from 10 to 49 acres; 322 from 50 to 99 acres; 322 from 100 to 179 acres; 138 from 180 to 259 acres; 90 from 260 to 499 acres; 24 from 500 to 999 acres; and 8 that were 1,000 acres or more. The average number of acres to a farm was 125.0 in 1950, compared to 93.4 acres in 1920.

LAND USE

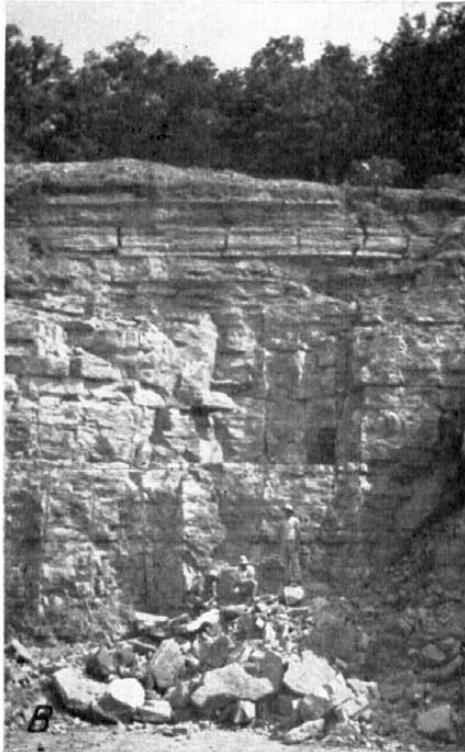
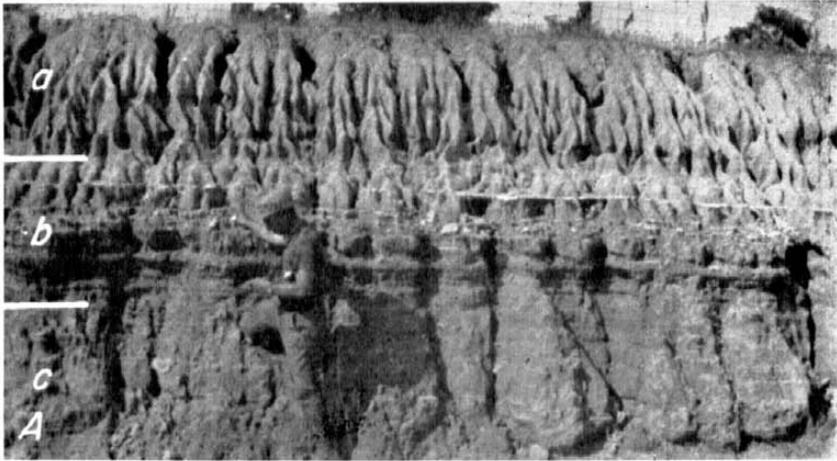
Land use shifted from forestry to agriculture as settlement continued, first fairly rapidly, but after 1880 at a slow rate. In 1949, 33,302 acres of the 162,205 acres in farms was harvested cropland; 18,373, cropland used only for pasture; 18,042, cropland not harvested and not pastured; 78,786, woodland; 7,838, other pasture, and 8,864, other land.

The number of farms and the percentage of the county in farms have decreased since 1920. In 1920 farms occupied 91.9 percent of the county, but in 1950 they occupied only 74.6 percent. There were 1,813 farms in 1920, and 1,322 farms in 1950.

FARM TENURE

Farms operated by owners increased from 58.3 percent in 1920 to 76.4 percent in 1950. In 1950, 717 farms were operated by full owners, 292 by part owners, 312 by tenants, and 1 by a manager.

Tenants are classified as (1) cash renters, (2) share renters, and (3) sharecroppers. The cash renter pays the owner a stipulated cash rate based on acreage. Very little land is rented in this way in the county, so no definite cash rentals have been established.



A, Road cut exposing three major geologic formations: *a*, Loess; *b*, Coastal Plain materials; and *c*, cherty limestone residuum.
B, Exposure of level-bedded massive high-grade Silurian limestone, the main source of agricultural lime for the county.



A, Lime crusher in area of high-grade limestone.

B, Limestone outcrops on Rolling stony land (Talbot and Colbert soil materials).



A, View of Alto silt loam on stream terraces.
B, Hay on Beechy silt loam in background; corn on Hymon soils in foreground.
C, New homestead on Bodine cherty silt loam, hilly phase.



A, Cut in Dulac silt loam, undulating phase, showing ferruginous sandstone layer formed at contact of silt and underlying sand.
B, Cropland on Savannah loam, eroded rolling phase.
C, Planting cotton on Savannah soils.

The share renters, the largest group of tenants, furnish all the labor, equipment, work stock, and seed and give the landlord one-fourth of the cash crops and one-third of the feed crops. In many cases the landlord furnishes them one-third or one-fourth of the fertilizer.

The sharecropper furnishes all the labor, one-half the fertilizer, and one-half the seed and gives the landlord one-half of all crops produced. In sharecropping, the owner usually manages the farm and furnishes the work stock, one-half the fertilizer, and one-half the seed.

SOIL SURVEY METHODS AND DEFINITIONS

Soil surveying consists of the examination, classification, and mapping of soils in the field. The soil scientist walks over the area at intervals and bores into the soil with an auger or digs holes with a spade. Each such boring, or hole, shows the soil to consist of several distinctly different layers, called horizons, which are collectively known as the soil profile. Each of these layers is studied carefully for the things about it that affect plant growth.

The color of each layer is noted. The darkness of the topmost layer is usually related to its content of organic matter. Streaks and spots of gray, yellow, and brown in lower layers generally indicate poor drainage and poor aeration.

Texture, or the content of sand, silt, and clay in each layer, is first determined by the way the soil feels when rubbed between the fingers and is later checked by mechanical analyses in the laboratory. Texture has much to do with the quantity of moisture the soil will hold available to plants, whether plant nutrients or fertilizers will be held by the soil in forms available to plants or will be leached out, and how hard the soil may be to cultivate.

Structure—or the way the soil granulates, and the number of pores or open spaces between particles—indicates how easily plant roots can penetrate the soil and how easily water enters it. Consistence, or the tendency of the soil to crumble or to stick together, indicates how difficult it is to keep the soil open and porous under cultivation.

The kinds of rock (or parent material) from which the soil has been developed affect the quantities and kinds of plant nutrients the soil may have naturally.

Simple chemical tests show how acid the soil may be. In a practical sense, the degree of acidity may be thought of as the degree of poverty in lime (available calcium). An acid soil is relatively low in lime content, a neutral soil is about medium, and an alkaline soil is high. Reaction refers to the degree of acidity or alkalinity a soil has. It is expressed quantitatively as follows:

	<i>pH value</i>		<i>pH value</i>
Extremely acid.....	Below 4.5	Neutral.....	6.6-7.3
Very strongly acid.....	4.5-5.0	Mildly alkaline.....	7.4-8.0
Strongly acid.....	5.1-5.5	Strongly alkaline.....	8.1-9.0
Medium acid.....	5.6-6.0	Very strongly alkaline..	9.1 and higher
Slightly acid.....	6.1-6.5		

The depth to bedrock or to compact layers is determined, and the quantity of gravel or rocks that may interfere with cultivation, the

steepness and kind of slope, the quantity of soil lost by erosion, and other external features are described.

On the basis of all these characteristics, soil areas much alike in the kind, thickness, and arrangement of layers are mapped as one soil type. A phase is a subdivision of the type. Some soil types possess a narrow range of characteristics and hence are not divided into phases; others with a wide range of characteristics are mapped in two or more phases. For example, if a soil type has slopes that range from 2 to 12 percent, the type may be mapped in two phases—an undulating phase (2- to 5-percent slopes) and a rolling phase (5- to 12-percent slopes); or a soil that has been eroded in places may be mapped in two or more phases—an uneroded phase, an eroded phase, and perhaps a severely eroded phase. A soil type will be broken into phases primarily because of differences in the soil other than those of kind, thickness, and arrangement of layers. The slope of a soil, the frequency of outcropping bedrock, the extent of erosion, or artificial drainage are examples of characteristics that might cause a soil type to be divided into phases.

Two or more soil types may have similar profiles; that is, the soil layers may be nearly the same, but the texture, especially of the surface layer, will differ. As long as the other characteristics of the soil layers are similar, however, these soils are classified in the same soil series. A soil series therefore consists of all soil types about the same in kind, thickness, and arrangement of layers, except for texture, particularly of the surface layer, whether the number of such soil types is only one or several.

The name of a place where a soil series was first found is chosen as the name of the series; thus, Savannah, Bodine, Ruston, and Dulac are names of important series in this county. The name of the surface texture is added to the series name to give the type name. Savannah clay loam and Savannah loam are names of two types within the Savannah series. They differ in texture of the surface soils, as their names show.

Savannah loam is divided into four phases according to relief and erosion as follows: Savannah loam, undulating phase; Savannah loam, rolling phase; Savannah loam, eroded undulating phase; and Savannah loam, eroded rolling phase. The slopes of the undulating phase fall from 2 to 5 feet in every 100 feet; those of the rolling phase, 5 to 12 feet in every 100 feet.

When two or more kinds of soil are so intricately mixed that they cannot be shown separately on a map of the scale used, they are mapped together and the areas are called a soil complex. In this county, Cuthbert-Savannah fine sandy loams, hilly phases, is a complex of Cuthbert fine sandy loam, hilly phase, and Savannah fine sandy loam, hilly phase.

Areas of bare rocky hillsides and rough gullied lands that have little true soil are not designated with series and type names but are given descriptive names such as rolling stony land, rough gullied land, and so on. Collectively they are known as miscellaneous land types. Rolling stony land (Talbot and Colbert soil materials) and Rough gullied land (Cuthbert and Luverne soil materials) are land types in Decatur County.

The soil type or, where the type is subdivided, the soil phase, is the unit of mapping in soil surveys. Because these units are more nearly uniform than broader groups or classes of soils, more definite statements about their use and management can be made. One can say, for example, that the Savannah series consists of soils low in organic matter and plant nutrients and very strongly acid that respond to good management practices when used for field crops common to the region. More specific statements can be made for phases or types. It can be stated that Savannah loam, eroded undulating phase, has mild (2 to 5 percent) slopes and requires less costly erosion control measures than does Savannah loam, eroded rolling phase, which has stronger (5 to 12 percent) slopes. Or it may be said that Savannah clay loam, severely eroded rolling phase, has slopes similar to those of Savannah loam, eroded rolling phase, but it is no longer suitable for crops because it is severely eroded as a result of improper use and poor management in the past. All three phases are included in the Savannah series.

SOILS

The soils of the county differ greatly in color, texture, consistence, depth to underlying material, acidity, fertility, relief, stoniness, permeability, and drainage—qualities that affect their productivity, workability, and conservability, and accordingly, the agricultural uses to which they are suited.

The well-developed soils occur only on uplands and high terraces; they have developed in an environment of moderately high temperature, heavy rainfall, and forest vegetation. Because of their location the upland soils have been more severely leached; consequently, even in their virgin state they are acid and low in organic matter and fertility. Their fertility and organic-matter content differ in the virgin state, and such differences often have been further widened by cropping, erosion, and other artificially stimulated processes of impoverishment. In contrast to the upland soils, many of the soils on bottom lands and low terraces (second-bottoms) are high in natural fertility, moderately well supplied with bases, especially lime, and fairly well supplied with organic matter.

The soils of the county range from nearly white through gray, yellow, and brown to red. Colors intermediate between brown and light gray predominate in the surface soils; browns and yellows dominate in the subsoils. Texture and consistence range from loose incoherent sands to tough tenacious clays. Predominantly, however, surface soils are silt loams and fine sandy loams; and subsoils, silty clay loams and clays. The surface soils are mostly mellow and friable, whereas the subsoils are friable to very strongly plastic. Loose fragments of chert or limestone outcrops are common in most of the soils developed over limestone.

Although the majority of the soils are strongly to very strongly acid, a significant number are only slightly to medium acid. Some soils are very low in natural fertility; others are relatively high. Most of them are intermediate between these two extremes. The organic-matter content is generally not high, but the soils differ considerably in this characteristic.

Most of the soils have favorable tilth, but some puddle, bake on the surface, and become cloddy if tilled when moisture supplies are unfavorable. With relatively few exceptions, such refractory surface soils have been exposed by erosion of the original surface layers.

The soils are prevailing rolling to hilly, but some are nearly level, and some are steep. Most of the soils are well drained, but some are poorly drained or imperfectly drained.

Conspicuous in most of the gently sloping soils of the uplands and terraces is a compact layer, generally referred to as a siltpan or claypan. This compact layer usually occurs at approximately 2 feet, but in some soils lies at shallower depths.

Differences in the soils already mentioned make them different in relative suitability for agriculture. Some are highly productive, easy to work, and easy to conserve and therefore physically very well suited to agriculture. Others are low in productivity, difficult to work, and difficult to conserve and are therefore unsuited or very poorly suited to agricultural uses. Most of the soils, however, are between these two extremes. On the basis of differences in productivity, workability, and conservability the soils have been classified as: First-class, Second-class, Third-class, Fourth-class, and Fifth-class soils. Under ordinary management the First-, Second-, and Third-class soils are considered suitable for tilled crops; Fourth-class soils, unsuitable or very poorly suitable for tilled crops but suitable for permanent pasture; and Fifth-class soils, unsuitable or very poorly suitable for crops or permanent pasture but suitable for forestry.

The more progressive agricultural communities have good farm houses, other farm buildings, and fences and ample farm equipment. Generally these communities are in areas where the predominating soils are of the Huntington, Lindside, and Sequatchie series.

Agriculture generally appears less prosperous in upland areas where Dulac and Savannah soils predominate, as these soils are naturally low in fertility. They respond to good management, however, and are adapted to a wide variety of crops. Agriculture in this area is consequently more diversified than on the bottom lands.

Poor farm buildings and fences, inadequate farm machinery, and other indications of lack of prosperity are evident in areas where Cuthbert, Ruston, Luverne, and Beechy soils predominate. In the cherty Limestone Hills section, most of the soils of the upland are not suitable for crops, but those of the bottom lands are relatively productive. The well-being of the people in this area is obviously related to the area of bottom land available for crop production.

SOIL SERIES AND THEIR RELATIONS

The soils of the county can be divided into four main groups based on their position in the landscape and on the source of their parent materials: (1) Soils of uplands, (2) soils of terrace lands, (3) soils of colluvial lands, and (4) soils of bottom lands.

The key to the soil series, table 3, will aid in identifying the soils and showing their relations.

SOILS OF UPLANDS

Soils of the uplands occupy higher lands above stream valleys and have developed from residual materials left after weathering of the

underlying sedimentary rocks or loess. Their characteristics are generally closely associated with the character of the underlying rocks from which the parent materials have been weathered. In this county four classes, or groups, of parent material are easily recognized: (1) Loess (wind-blown silt), (2) Coastal Plain sand and clay, (3) limestone, and (4) interbedded limestone and shale. The soils therefore can be classified on the basis of differences in their underlying material, as (1) soils derived from a thin silt mantle, (2) soils derived from Coastal Plain sands and clays, (3) soils derived from limestone, and (4) soils derived from interbedded limestone and shale. These groups include all the true upland soils. A fifth class, miscellaneous land types, is composed of areas that have no true soil.

SOILS DERIVED FROM A THIN SILT MANTLE

The soils derived from a thin silt mantle—the Dulac, Tippah, and Dickson—are moderately well drained acid soils with a siltpan at a depth of about 2 feet. They have yellowish-gray silt loam surface soils, brownish-yellow silty clay loam subsoils, and a siltpan just below the subsoil.

Differences among the series are closely related to the differences among the materials underlying the loess from which the soils have developed. Dickson soils are underlain by cherty limestone material; Dulac and Tippah soils, by Coastal Plain sand and clay that differ under the different soils chiefly in texture and consistence and thereby in perviousness to water. The Dulac soils are underlain by a semi-pervious sandy clay; the Tippah, by relatively impervious clay. The siltpan varies in thickness and degree of compaction in the different soils, but it is not a differentiating characteristic between the Dulac and Tippah soils.

SOILS DERIVED FROM COASTAL PLAIN SANDS AND CLAYS

Soils derived from Coastal Plain sand and clay are those of the Savannah, Ruston, Safford, Shubuta, Cuthbert, Luverne, and Susquehanna series. Soils of these series differ in many characteristics but all of them have developed from unconsolidated sands or clays. The surface soils are loams to loamy sands, but the subsoils range from fine sandy clay loam to heavy clay. The differences among the soil series are very closely related to differences among the materials from which the soil series have developed and to differences in slope. The soil series are distinguished in the field chiefly by differences in color, consistence, and texture, though they also differ greatly in other characteristics.

The Savannah soils are characterized by a yellowish-gray surface soil, a brownish-yellow subsoil, and a hardpan layer below the subsoil. The surface soil is loam, whereas that of the Dulac and Tippah soils is silt loam. The typical Ruston soils have a loose, thick, fine sandy loam or loamy fine sand surface soil and very friable reddish-brown subsoil and substratum.

Both the Shubuta and Safford soils have a tough, plastic clay subsoil, but they differ in color, structure, and character of underlying material. The Safford soils have a reddish-brown subsoil, and the underlying sandy clay contains considerable green sand. The Shubuta soils have a yellowish-red subsoil, and the underlying sandy clay contains thin layers of bluish-gray clay.

TABLE 3.—Key to soil series of Decatur County, Tenn.

Topographic position, geologic material, and parent material	Excessively drained ¹	Well drained ²	Moderately well drained ³	Imperfectly drained ⁴	Poorly drained ⁵
Soils of uplands:					
Unconsolidated wind deposits (loess) overlying Coastal Plain sand and clay or cherty limestone:					
Silt with sandy clay below 24-42 inches			Dulac		
Silt with clay below 24-42 inches			Tippah		
Silt with cherty limestone below 24-42 inches			Dickson		
Unconsolidated water deposits (Coastal Plain sand and clay):					
Sand		Ruston			
Glauconitic sand and clay		Safford	Savannah		
Clay	Susquehanna				
Sandy clay (reddish yellow)	Cuthbert	Shubuta			
Sandy clay (red)		Luverne			
Consolidated water deposits (limestone):					
Clayey limestone		Talbott			
Cherty limestone	Bodine				
Phosphatic limestone	Inman	Maury			
Phosphatic limestone and shale, interbedded					
Soils of terrace lands:					
Old general alluvium:					
High terraces:					
Loess mantle over alluvium washed chiefly from limestone-derived soils		Pickwick	Paden	Taft	Robertsville.
Chiefly limestone-derived soils					
Sandstone- and limestone-derived soils		Etowah			
Loess and Coastal Plains sand and clay		Waynesboro	Freeland	Hatchie	Almo.
Low terraces:		Dexter			
Chiefly limestone-derived soils			Wolfvever	Taft	Robertsville.
Cherty limestone-derived soils		Humphreys		do	Do.
Sandstone- and limestone-derived soils		Sequatchie			

Soils of colluvial lands: Local alluvium and some colluvial material washed from soils derived from—	Tigrett Alva Greendale Emory	Briensburg Eupora	
Loess Loess and Coastal Plain sand and clay Cherty limestone Limestone			
Soils of bottom lands: Recent alluvium on streams bottoms washed from soils derived from—	Shannon Huntington	Hymon Lindside	Beechy Melvin
Loess and Coastal Plain sand and clay Chiefly limestone Chiefly limestone (slack-water deposits) Cherty sandstone Cherty limestone	Bruno Ennis	do do	Do. Do. Do.

¹ Indistinct profile; surface drainage rapid to very rapid; internal drainage slow to very rapid. Color varies with parent material.
² Soils of uplands and terrace lands are brown or reddish brown, free of mottling to depths of 36 inches or more. Soils of colluvial and bottom lands are brown to brownish gray, free of mottling to depths of 24 inches or more.
³ Brownish yellow or yellowish brown; free of mottling to depths of 20 to 24 inches. Drainage retarded by siltpan. Saturated for short periods within 12 inches of surface.
⁴ Soils of uplands and terrace lands have pale-yellow subsoil showing some mottling; strongly mottled below 12 to 16 inches.

Internal drainage retarded by siltpan or claypan. Soil saturated much of time within 12 inches of surface. Soils of colluvial and terrace lands are grayish brown to brownish gray, mottled below 12 inches.
⁵ Soils of uplands and terrace lands are light gray or yellowish gray; some brown, yellow, or yellowish-white mottling below 6 to 8 inches. Internal drainage greatly retarded by siltpan or claypan. Entire soil saturated much of the time. Soils of colluvial and terrace lands are brownish gray to light gray, mottled below 6 to 8 inches.

The Shubuta and Cuthbert soils have similar parent materials; they differ chiefly in degree of profile development. Soils of both series have a gray or grayish-yellow fine sandy loam surface soil, but the Cuthbert surface soil is underlain by strongly plastic clay highly mottled with red, yellow, and gray. Cuthbert soils occur on ridge slopes, whereas Shubuta soils are on ridge crests in most places.

The Luverne soils have also developed from heavy sandy clay materials, but they differ from the Shubuta soils in having a red subsoil. The Susquehanna soils, derived from heavy acid clay, differ from the Cuthbert soils in having a subsoil more strongly plastic and more highly mottled. The Susquehanna surface soil and subsoil layers are thinner; this soil represents the extreme in texture and consistence.

SOILS DERIVED FROM LIMESTONE

Soils of the Bodine, Talbott, and Maury series are derived from limestone. The Bodine soils are shallow and readily identified by numerous angular chert fragments on the surface and throughout the profile. They occur on relatively steep ridge slopes in most places and have very weakly developed textural profiles.

The Talbott soils, derived from clayey limestone residuum, are characterized by a yellowish-red strongly plastic subsoil. They are relatively free of chert, but bedrock outcrops are common in most areas.

The Maury soils, derived from phosphatic limestone residuum, are deeper, browner, and more friable than the Talbott soils with which they are associated. They have a brown surface soil and a reddish-brown moderately friable subsoil.

SOILS DERIVED FROM INTERBEDDED LIMESTONE AND SHALE

The soils derived from interbedded limestone and shale are members of the Inman series. Inman soils are shallow and have shale particles on the surface and throughout the profile. They are closely associated with the Maury soils but are shallower over bedrock, lighter colored, and heavier textured. They have a grayish-brown silt loam surface soil and a brownish-yellow strongly plastic silty clay subsoil spotted with gray and yellow in most places.

MISCELLANEOUS LAND TYPES

Miscellaneous land types are composed of areas having no true soil because of a large number of bedrock outcrops or severe erosion. There are eight of these land types in the county; two are extremely stony and the others are very severely eroded. The main differences and general nature of the land types are indicated by their names: (1) Rolling stony land (Talbott and Colbert soil materials), (2) Hilly stony land (Talbott and Colbert soil materials), (3) Rough gullied land (Cuthbert and Luverne soil materials), (4) Rough gullied land (Savannah and Ruston soil materials), (5) Rough gullied land (Tippah and Dulac soil materials), (6) Rough gullied land (Freeland and Paden soil materials), (7) Rough gullied land (Etowah and Dexter soil materials), and (8) Rough gullied land (Talbott soil material).

SOILS OF TERRACE LANDS

The origin of the soils of terrace lands lies in the geologic past when present rivers and streams were flowing at considerably higher levels and depositing gravel, sand, and clay on their flood plains. During the progress of stream cutting, which continued a great number of years, stream channels were gradually deepened, and although new flood plains were formed at the lower levels, remnants of the older higher lying flood plains were left. The areas that were left consist of general stream alluvium but are now above the overflow stage of the present streams and constitute what is referred to as terrace land. They are frequently also referred to as second bottoms or benches.

The soils of the terrace lands are divided into subgroups according to differences in origin of their parent materials. They are (1) soils derived from old alluvium washed from soils derived from loess and Coastal Plain materials; (2) soils derived from old alluvium washed from soils underlain by a variety of materials, including limestone; (3) soils derived from old alluvium washed chiefly from soils underlain by cherty limestone material; and (4) soils derived from old mixed alluvium washed chiefly from soils underlain by sandstone.

SOILS DERIVED FROM OLD ALLUVIUM WASHED FROM SOILS DERIVED FROM LOESS AND COASTAL PLAIN MATERIALS

Soils of the Dexter, Freeland, Hatchie, and Almo series are derived from old alluvium that washed from soils derived from loess and Coastal Plain materials. These soils, for the most part, have formed from old mixed alluvium that washed chiefly from uplands underlain by wind-blown silt and unconsolidated sand and clay. They occur on the high terraces of larger streams in the Coastal Plain and Loess Plain sections of the county. Their differences in characteristics are caused chiefly by differences in drainage. The well-drained Dexter soils are easily identified by their reddish-brown subsoil. The moderately well-drained Freeland soils have a brownish-yellow or yellowish-brown subsoil and a siltpan at a depth of about 2 feet. The imperfectly drained Hatchie soils have a pale-yellow subsoil and a strongly developed siltpan. The poorly drained Almo soil is predominantly light gray throughout its profile.

SOILS DERIVED FROM OLD ALLUVIUM WASHED FROM SOILS UNDERLAIN BY A VARIETY OF MATERIALS, INCLUDING LIMESTONE

This group includes members of the Etowah, Pickwick, Paden, Taft, Robertsville, and Wolftever series. The old alluvium from which the soils have developed washed from uplands underlain by a wide variety of rock, including shale, sandstone, limestone, loess, and Coastal Plain sand and clay. Limestone materials, however, are thought to be predominant in most of the alluvium.

The Pickwick, Paden, Taft, and Robertsville soils are on high terraces of the Tennessee River. These terraces are covered with a thin layer of loess in most places. The well-drained Pickwick soils are identified by their friable reddish-brown gravel-free subsoil. The moderately well-drained Paden soils have a yellowish-brown or brownish-yellow subsoil and a siltpan at a depth of about 2 feet. The im-

perfectly drained Taft soil has a pale-yellow subsoil and a strongly developed siltpan. The poorly drained Robertsville soil is predominantly light gray throughout. The Taft and Robertsville soils are also associated with Wolftever and Sequatchie soils of the low terraces along the Tennessee River.

The Etowah soils are similar to the Pickwick soils in color and drainage, but they are from alluvium washed chiefly from limestone. Etowah soils are readily identified by the gravel on the surface and throughout the profile.

The Wolftever soils are on the younger and lower terraces and occasionally receive overflow from streams along which they occur. They have a silt loam surface soil and a compact yellowish-brown or brownish-yellow subsoil; they are only moderately well drained.

**SOILS DERIVED FROM OLD ALLUVIUM WASHED CHIEFLY FROM SOILS UNDERLAIN BY
CHERTY LIMESTONE MATERIAL**

Humphreys soils make up the group derived from old alluvium that washed chiefly from soils underlain by cherty limestone. They occur on low terraces along streams in the Limestone Hills section. They are characterized by chert fragments in the profile, though the silt loam type has a relatively chert-free surface soil. Humphreys soils are brown and well drained and occur in association with Ennis soils of the first bottoms. The poorly drained and imperfectly drained terrace soils associated with the Humphreys soils belong to the Robertsville and Taft series, respectively.

**SOILS DERIVED FROM OLD MIXED ALLUVIUM WASHED CHIEFLY FROM SOILS UNDERLAIN
BY SANDSTONE**

The soils derived from old mixed alluvium washed chiefly from soils underlain by sandstone are members of the Waynesboro and Sequatchie series. The alluvium from which these soils are derived consists of a wide variety of materials, including limestone, shale, loess, and Coastal Plain sand and clay. Materials from sandstone predominate.

The well-drained Waynesboro soil is on high terraces and has a grayish-yellow or yellowish-gray fine sandy loam surface soil and a friable light brownish-red sandy clay loam subsoil.

The brown well-drained Sequatchie soil is on low terraces subject to occasional overflow. It is closely associated with the Wolftever soils but differs in being brown and sandy throughout its profile.

SOILS OF COLLUVIAL LANDS

The soils of the colluvial lands occupy sloping fans and benches at the base of slopes, particularly the longer slopes on which erosion has been active. They are formed from soil material and rock fragments washed and rolled from adjacent slopes. Three subgroups can be made according to differences in the general character of the parent materials: (1) Soils derived from colluvium washed chiefly from soils underlain by loess material, (2) soils derived from colluvium washed chiefly from soils underlain by loess and Coastal Plain materials, and (3) soils derived from colluvium washed chiefly from soils underlain by limestone material.

SOILS DERIVED FROM COLLUVIUM WASHED CHIEFLY FROM SOILS UNDERLAIN BY LOESS MATERIAL

The soils derived from colluvium washed chiefly from soils underlain by loess material are the Tigrett and Briensburg. Like the Alva and Eupora soils, they are on gently sloping areas that have good surface drainage.

The Tigrett soil is brown, friable, and well drained. It differs from the Alva soil chiefly in being relatively free of sand in the upper part of the profile.

The Briensburg soil differs from the Tigrett soil chiefly in being imperfectly drained, and from the Eupora soil in being relatively free of sand. Its drainage is similar to that of the Eupora soil. It has a grayish-brown surface soil but is highly mottled below 10 to 18 inches.

The soils of this group are associated mainly with Dulac, Tippah, Pickwick, and Paden soils, from which their parent material has been washed.

SOILS DERIVED FROM COLLUVIUM WASHED CHIEFLY FROM SOILS UNDERLAIN BY LOESS AND COASTAL PLAIN MATERIALS

Soils derived from colluvium washed chiefly from soils underlain by loess and Coastal Plain materials are members of the Alva and Eupora series.

The Alva are brown friable well-drained soils differing from the Tigrett soil chiefly in having a fine sandy loam texture.

The Eupora soil is imperfectly drained. It has a grayish-brown surface soil but is highly mottled below 10 to 18 inches. The Eupora soil differs from the Briensburg soil chiefly in having a fine sandy loam rather than a silt loam texture.

Alva and Eupora soils are associated chiefly with Savannah, Ruston, Safford, and Cuthbert soils of the uplands.

SOILS DERIVED FROM COLLUVIUM WASHED CHIEFLY FROM SOILS UNDERLAIN BY LIMESTONE MATERIAL

Soils derived from colluvium washed chiefly from soils underlain by limestone material are members of the Greendale and Emory series. Their parent material has washed from adjacent slopes, the soils on which are underlain by limestone. They are along small drainage-ways, at the base of upland slopes, and on small sloping alluvial-colluvial fans where small streams have deposited their load over the broad flood plains of larger streams.

The parent material of the Greendale soils came chiefly from cherty limestone. Greendale soils are grayish brown, well drained, young, and characterized by many chert fragments on the surface and throughout the profile.

The parent materials of the Emory soil came from noncherty relatively high-grade limestone. The Emory soil is brown, friable, and well-drained. It differs from the Greendale soils in being relatively chert-free, browner, and heavier textured.

In this county, the Emory soil is associated chiefly with the Maury and Talbott soils, whereas the Greendale soils are associated chiefly with the Bodine and Dickson soils.

SOILS OF BOTTOM LANDS

The soils of the bottom lands, or flood plains, occupy nearly level areas along streams and are subject to flooding. The material giving rise to the bottom land soils has been deposited by the streams, and its character depends largely upon its source in the higher lying lands and the rate at which water was moving when the material was deposited. The soils in the bottoms are young. The material from which they are developing has not lain in place long enough to develop well-defined surface soil and subsoil layers, as have most of the soils of the uplands and terraces.

Soils of bottom lands are divided into subgroups according to differences in parent materials as follows: (1) Soils derived from alluvium washed chiefly from soils underlain by loess and Coastal Plain materials, (2) soils derived from alluvium washed from soils underlain by a wide variety of materials, including limestone, (3) soils derived from alluvium washed chiefly from soils underlain by sandstone and Coastal Plain sand, and (4) soils derived from alluvium washed chiefly from soils underlain by cherty limestone material.

SOILS DERIVED FROM ALLUVIUM CHIEFLY FROM SOILS UNDERLAIN BY LOESS AND COASTAL PLAIN MATERIALS

Soils derived from alluvium washed chiefly from soils underlain by loess and Coastal Plain materials are members of the Shannon, Hymon, and Beechy series. These soils are on first bottoms along the streams in the Coastal Plain and Loess Plain sections. The well-drained Shannon soils are brown and free of mottlings to a depth of 20 inches or more. The imperfectly drained Hymon soils have a grayish-brown surface layer but are highly mottled below about 10 inches. The poorly drained Beechy soils are predominantly gray throughout their profile.

SOILS DERIVED FROM ALLUVIUM FROM SOILS UNDERLAIN BY A WIDE VARIETY OF MATERIALS, INCLUDING LIMESTONE

The soils derived from alluvium from upland soils underlain by a wide variety of materials, including limestone, are members of the Huntington, Egam, Lindside, and Melvin series. The Huntington soil—brown, friable, and well drained—occurs chiefly on low first bottoms. The Egam soil is dark grayish brown, compact, and moderately well drained and occurs chiefly on high first bottoms; the Lindside soils are imperfectly drained; the Melvin soil is poorly drained. Soils of this group occur chiefly on the flood plains of the Tennessee River.

SOILS DERIVED FROM ALLUVIUM CHIEFLY FROM SOILS UNDERLAIN BY SANDSTONE AND COASTAL PLAIN SAND

The soils derived from alluvium chiefly from soils underlain by sandstone and Coastal Plain sand belong to the Bruno series. These soils are on the Tennessee River first bottoms and are characterized by an extremely sandy texture. They are on the natural levees in most places.

SOILS DERIVED FROM ALLUVIUM CHIEFLY FROM SOILS UNDERLAIN BY CHERTY LIMESTONE MATERIAL

Soils derived from alluvium that came chiefly from soils underlain by cherty limestone material are members of the Ennis series. Ennis soils consist of materials washed chiefly from cherty Bodine soils and deposited on the flood plains of streams in the Limestone Hills section. The light-brown well-drained Ennis soils are characterized by varying quantities of chert fragments on the surface and throughout the profile. The imperfectly and poorly drained soils associated with the Ennis soils are members of the Lindside and Melvin series.

DESCRIPTION OF THE SOILS

In the following pages the soils of Decatur County are described in detail, and their relations to agriculture, including present use and management, use suitability, and management requirements, are set forth. The acreage and proportionate extent of these soils are listed in table 4, and their location and distribution are shown on the soil map that accompanies this report.

TABLE 4.—*Approximate acreage and proportionate extent of the soils of Decatur County, Tenn.*

Soil	Acres	Percent
Almo silt loam.....	613	0.3
Alva fine sandy loam.....	423	.2
Beechy fine sandy loam.....	1,284	.6
Beechy silt loam.....	5,179	2.5
Bodine cherty silt loam:		
Eroded hilly phase.....	836	.4
Hilly phase.....	10,656	5.0
Rolling phase.....	3,424	1.6
Severely eroded hilly phase.....	346	.2
Steep phase.....	13,711	6.5
Bodine silt loam:		
Eroded hilly phase.....	494	.2
Eroded rolling phase.....	860	.4
Hilly phase.....	2,337	1.1
Rolling phase.....	3,569	1.7
Bodine silty clay loam, severely eroded rolling phase.....	246	.1
Briensburg silt loam.....	6,041	3.0
Bruno fine sandy loam.....	559	.3
Bruno loamy fine sand.....	280	.1
Cuthbert-Luverne clay loams:		
Eroded hilly phases.....	236	.1
Severely eroded hilly phases.....	484	.2
Cuthbert-Luverne fine sandy loams, hilly phases.....	3,171	1.5
Cuthbert-Savannah clay loams:		
Eroded hilly phases.....	623	.3
Severely eroded hilly phases.....	1,989	.9
Cuthbert-Savannah fine sandy loams, hilly phases.....	6,106	3.0
Dexter silt loam:		
Eroded rolling phase.....	548	.3
Eroded undulating phase.....	630	.3
Hilly phase.....	215	.1
Rolling phase.....	182	.1
Dexter silty clay loam:		
Severely eroded hilly phase.....	258	.1
Severely eroded rolling phase.....	888	.4

TABLE 4.—*Approximate acreage and proportionate extent of the soils of Decatur County, Tenn.—Continued*

Soil	Acres	Percent
Dickson silt loam:		
Eroded rolling phase.....	860	0.4
Eroded undulating phase.....	548	.3
Rolling phase.....	2,464	1.2
Undulating phase.....	860	.4
Dickson silty clay loams, severely eroded rolling phase.....	413	.2
Dulac silt loam:		
Eroded rolling phase.....	1,128	.5
Eroded undulating phase.....	2,795	1.3
Rolling phase.....	861	.4
Slightly eroded undulating phase.....	699	.3
Undulating phase.....	1,334	.6
Dulac silty clay loam, severely eroded rolling phase.....	1,042	.5
Egam silty clay loam.....	1,096	.5
Emory silt loam.....	3,698	1.8
Ennis cherty silt loam.....	731	.3
Ennis silt loam.....	3,107	1.5
Etowah gravelly silt loam:		
Eroded hilly phase.....	213	.1
Hilly phase.....	1,193	.6
Severely eroded hilly phase.....	227	.1
Steep phase.....	623	.3
Eupora fine sandy loam.....	3,535	1.7
Freeland silt loam:		
Eroded rolling phase.....	957	.5
Eroded undulating phase.....	3,093	1.5
Rolling phase.....	357	.2
Undulating phase.....	723	.3
Freeland silty clay loam, severely eroded rolling phase.....	978	.5
Greendale cherty silt loam:		
Rolling phase.....	406	.2
Undulating phase.....	3,521	1.7
Hatchie fine sandy loam.....	398	.2
Hatchie silt loam.....	1,118	.5
Hilly stony land (Talbot and Colbert soil materials).....	2,184	1.0
Humphreys cherty silt loam.....	226	.1
Humphreys silt loam.....	1,295	.6
Huntington silt loam.....	248	.1
Hymon fine sandy loam.....	2,494	1.2
Hymon silt loam.....	4,408	2.1
Inman silt loam, hilly phase.....	321	.1
Inman silty clay loam, eroded hilly phase.....	154	.1
Lindside silt loam.....	4,292	2.0
Lindside silty clay loam.....	376	.2
Maury silt loam, rolling phase.....	227	.1
Maury silty clay loam:		
Eroded rolling phase.....	387	.2
Eroded undulating phase.....	172	.1
Severely eroded rolling phase.....	165	.1
Melvin silt loam.....	2,172	1.0
Paden silt loam:		
Eroded rolling phase.....	699	.3
Eroded undulating phase.....	1,427	.7
Rolling phase.....	645	.3
Undulating phase.....	537	.3
Paden silty clay loam, severely eroded rolling phase.....	890	.4
Pickwick silt loam:		
Eroded hilly phase.....	204	.1
Eroded rolling phase.....	1,731	.8
Eroded undulating phase.....	1,268	.6

TABLE 4.—Approximate acreage and proportionate extent of the soils of Decatur County, Tenn.—Continued

Soil	Acres	Percent
Pickwick silt loam—Continued		
Hilly phase.....	978	0.5
Rolling phase.....	697	.3
Undulating phase.....	275	.1
Pickwick silty clay loam:		
Severely eroded hilly phase.....	525	.2
Severely eroded rolling phase.....	1,677	.8
Robertsville silt loam.....	441	.2
Rolling stony land (Talbot and Colbert soil material).....	901	.4
Rough gullied land:		
Cuthbert and Luverne soil materials.....	370	.2
Etowah and Dexter soil materials.....	206	.1
Freeland and Paden soil materials.....	88	(1)
Savannah and Ruston soil materials.....	335	.1
Talbot soil material.....	312	.1
Tippah and Dulac soil materials.....	203	.1
Ruston fine sandy loam:		
Eroded hilly phase.....	473	.2
Hilly phase.....	4,074	1.9
Steep phase.....	1,129	.5
Ruston sandy clay loam, severely eroded hilly phase.....	817	.4
Safford clay loam, severely eroded hilly phase.....	548	.3
Safford very fine sandy loam, hilly phase.....	1,408	.7
Savannah clay loam, severely eroded rolling phase.....	5,085	2.4
Savannah loam:		
Eroded rolling phase.....	6,299	3.0
Eroded undulating phase.....	604	.3
Rolling phase.....	14,287	6.8
Undulating phase.....	515	.2
Sequatchie fine sandy loam.....	1,010	.5
Shannon fine sandy loam.....	1,151	.6
Shannon silt loam.....	666	.3
Shubuta-Luverne clay loams, eroded rolling phases.....	537	.3
Shubuta-Luverne fine sandy loams, rolling phases.....	1,236	.6
Shubuta-Savannah clay loams:		
Eroded rolling phases.....	613	.3
Severely eroded rolling phases.....	731	.3
Shubuta-Savannah fine sandy loams, rolling phases.....	1,418	.7
Susquehanna very fine sandy loam.....	369	.2
Taft silt loam.....	1,032	.5
Talbot silt loam:		
Hilly phase.....	1,620	.8
Rolling phase.....	2,032	1.0
Talbot silty clay loam:		
Eroded hilly phase.....	514	.2
Eroded rolling phase.....	1,563	.7
Eroded undulating phase.....	279	.1
Severely eroded hilly phase.....	510	.2
Severely eroded rolling phase.....	922	.4
Talbot stony silt loam:		
Hilly phase.....	10,644	5.0
Rolling phase.....	2,353	1.1
Steep phase.....	1,455	.7
Talbot stony silty clay loam:		
Eroded hilly phase.....	845	.4
Eroded rolling phase.....	632	.3
Severely eroded hilly phase.....	671	.3
Severely eroded rolling phase.....	512	.2
Tigrett silt loam.....	344	.2

TABLE 4.—*Approximate acreage and proportionate extent of the soils of Decatur County, Tenn.—Continued*

Soil	Acres	Percent
Tippah silt loam:		
Eroded rolling phase.....	529	0.3
Rolling phase.....	435	.2
Tippah silty clay loam, severely eroded rolling phase.....	1,011	.5
Waynesboro fine sandy loam.....	251	.1
Wolftever silt loam.....	376	.2
Slightly eroded phase.....	516	.2
Wolftever silty clay loam, eroded phase.....	488	.2
Total.....	211,200	100.0

¹ Less than 0.1 percent.

The acreages of soils inundated by the Kentucky Reservoir are as follows:

Soil	Acres	Soil	Acres
Beechy silt loam.....	65	Paden silty clay loam, severely eroded rolling phase.....	2
Bodine cherty silt loam:		Pickwick silt loam:	
Eroded hilly phase.....	2	Eroded rolling phase.....	21
Hilly phase.....	11	Eroded undulating phase.....	11
Severely eroded hilly phase....	13	Rolling phase.....	2
Steep phase.....	32	Undulating phase.....	32
Briensburg silt loam.....	21	Pickwick silty clay loam:	
Bruno fine sandy loam.....	559	Severely eroded hilly phase....	2
Bruno loamy fine sand.....	161	Severely eroded rolling phase....	11
Dexter silt loam, eroded undulating phase.....	9	Robertsville silt loam.....	43
Egam silty clay loam.....	430	Rolling stony land (Talbot and Colbert soil materials).....	2
Emory silt loam.....	86	Sequatchie fine sandy loam.....	86
Ennis silt loam.....	763	Shannon fine sandy loam.....	107
Eupora fine sandy loam.....	2	Shannon silt loam.....	86
Freeland silt loam:		Taft silt loam.....	172
Eroded undulating phase.....	2	Talbot silt loam, rolling phase....	43
Undulating phase.....	6	Talbot silty clay loam:	
Greendale cherty silt loam:		Eroded hilly phase.....	2
Rolling phase.....	2	Eroded rolling phase.....	6
Undulating phase.....	43	Severely eroded hilly phase....	6
Hilly stony land (Talbot and Colbert soil materials).....	2	Severely eroded rolling phase....	2
Humphreys silt loam.....	17	Talbot stony silt loam:	
Huntington silt loam.....	365	Hilly phase.....	43
Hymon fine sandy loam.....	11	Rolling phase.....	21
Hymon silt loam.....	107	Steep phase.....	43
Inman silt loam, hilly phase.....	2	Talbot stony silty clay loam:	
Inman silty clay loam, eroded hilly phase.....	2	Eroded hilly phase.....	4
Lindside silt loam.....	1,502	Eroded rolling phase.....	2
Lindside silty clay loam.....	129	Severely eroded hilly phase....	6
Maury silt loam, rolling phase....	6	Severely eroded rolling phase....	4
Maury silty clay loam:		Wolftever silt loam.....	183
Eroded undulating phase.....	2	Slightly eroded phase.....	204
Severely eroded rolling phase....	4	Wolftever silty clay loam, eroded phase.....	146
Melvin silt loam.....	892		
Paden silt loam, eroded undulating phase.....	2	Total.....	6,542

Almo silt loam (1-3% slopes) (A_A).—This gray poorly drained soil locally referred to as “crayfish land” or “white cold-natured land” (pl. 3, A) occurs in small irregularly shaped areas on most of the terraces along the larger streams flowing from the Coastal Plain and the Loess Plain sections of the county.

The largest acreage is on broad high terraces along the Beech River and Doe, Panther, and Turkey Creeks, where it is closely associated with Hatchie and Freeland soils. In most places on the broad terraces the soil is on nearly level or slightly depressed areas surrounded by Hatchie soils. A considerable acreage, however, is in narrow belts at the foot of adjacent upland slopes. The poor drainage in this position is partly caused by seepage.

The mixed alluvium from which the soil has formed washed from upland soils underlain by unconsolidated silt, sand, and clay. The soil has developed under a vegetation of water-tolerant trees, such as willow and shingle oaks, sweetgum, blackgum, birch, and willow.

Profile description:

- 0 to 10 inches, gray or light-gray mellow silt loam splotched with light gray or rust brown; 8 to 12 inches thick.
- 10 to 20 inches, friable silty clay loam highly mottled with gray, yellow, and brown.
- 20 to 44 inches, (siltpan) light-gray or bluish-gray very compact silt loam to silty clay loam.
- 44 inches +, moderately friable mixed alluvium ranging from silty clay loam or sandy clay loam to stratified layers of sand and silt; gray, yellow, and brown mottling.

In most places the soil profile is free of stone or gravel. Many small concretions occur throughout the profile, particularly in the siltpan.

The soil is very strongly acid and low in organic matter and plant nutrients. External and internal drainage are very slow. The surface soil and subsoil layers are moderately permeable; but the siltpan—relatively impermeable to roots, moisture, and air—is at shallow depth and gives the soil a low water-holding capacity.

Present use and management.—Because it occurs in small irregular areas, Almo silt loam is used and managed in the same way as the associated Hatchie and Freeland soils. Some areas are in pasture or hay, but most of them are used for crops, chiefly corn and cotton. All crop yields are low; row crops frequently fail completely. Pastures give moderate yields, but the forage is of very low quality.

Use and management requirements.—This soil is not well suited to common field crops, chiefly because it has poor drainage. Artificial drainage would broaden the agricultural suitability, but drains are difficult to install because of the compact siltpan, seepage from the adjacent slopes in some places, and the irregularity of the small areas. The soil is low in available plant nutrients and water-holding capacity; consequently, crop yields on the drained areas commonly are low. Probably the soil is best used for pasture, but it needs lime, phosphate, and potash if it is to give moderate yields of good quality forage. With improved fertilization, good quality pasture plants such as white clover, lespedeza, tall fescue, redbud, and Bermuda grass can be successfully grown.

Alva fine sandy loam (2-5% slopes) (A_B).—The small areas of this well-drained young soil occur on gently sloping alluvial fans

where small streams emerge onto larger flood plains, on gently sloping colluvial areas at the base of steep slopes, or along narrow drainage-ways. It is a soil widely distributed throughout the western part of the county, where it is associated chiefly with Eupora soil of colluvial lands, Shannon soils of bottom lands, and Ruston soils of uplands. It has formed from colluvium or mixed local alluvium washed from upland soils that are derived from wind-blown silt and unconsolidated Coastal Plain sand and clay. Because of its youth, the soil does not have well-defined textural horizons. The native vegetation was deciduous forest consisting chiefly of white and red oaks, beech, maple, and sweetgum.

Profile description :

- 0 to 12 inches, light-brown or grayish-brown loose fine sandy loam ; in wooded areas upper 2 or 3 inches is stained dark gray with organic matter ; 8 to 14 inches thick.
- 12 to 36 inches, light-brown or yellowish-brown friable fine sandy loam ; some gray splotches below 18 to 24 inches ; 12 to 24 inches thick.
- 36 inches +, light-gray sandy alluvium splotched with gray ; 0 to 4 feet thick.

The texture, depth of colluvial deposit, and drainage vary considerably. The surface layer has a fine sandy loam texture in most places, but the lower part of the profile varies from silt loam to loamy fine sand. The colluvial deposit ranges from about 2 to 10 feet deep. The depth to the mottled zone may be as little as 18 inches, but in most places it is 24 inches or more.

The soil is strongly to very strongly acid, relatively high in organic matter and plant nutrients, and very permeable. It has a high water-holding capacity in most places, but the capillary movement of moisture is broken by excessively sandy layers in some places. External and internal drainage are moderate. None of the areas except those along the small streams are subject to overflow, and those are flooded for only a short period.

Along the small drains the mapping unit contains small areas of nearly level Shannon soils. The inclusions and variations, however, do not differ significantly in use and management.

Present use and management.—Practically all of Alva fine sandy loam is cleared and is used for crops. About 60 percent is planted to corn, 15 percent to cotton, and 15 percent to miscellaneous crops. The rest is woodland or idle open land. Crops are not systematically rotated, and fertilization is not commonly practiced. Fair yields are obtained under continuous cropping to corn and cotton. For cotton most farmers use a 200-pound application of 20-percent superphosphate or a 4-10-4 mixture. Under common management corn yields about 30 bushels an acre ; cotton, about 280 pounds.

Use and management requirements.—Alva fine sandy loam is one of the more productive soils of the county and is suited to a wide variety of crops. It is well drained, fertile, good in moisture relations, and suitable for tillage over a wide range of moisture conditions. It is suited to intensive use and in most places can be maintained in a 3- or 4-year rotation. Lime is needed for legumes ; phosphate, for all crops. Applications of potash may improve crop yields, especially after several crops of legume hay have been harvested. Nitrogen fer-

tilizers may be needed for all except the legume crop and the crop immediately following.

Beechy silt loam (1-3% slopes) (B_B).—This poorly drained soil of the first bottoms is widely distributed throughout the Coastal Plain section. It is the most extensive soil on the flood plains of most streams in that section. In most places it occupies relatively large areas, chiefly in association with Hymon, Eupora, and Briensburg soils.

Owing to the abundance of crayfish chimneys, it is locally referred to as crayfish land. It has formed under deciduous forest consisting chiefly of water-tolerant oaks, sweetgum, blackgum, beech, birch, and willow. The parent material was mixed general alluvium washed from upland soils that were derived from wind-blown silt and Coastal Plain sand and clay. It is a young soil and does not have well-developed textural horizons.

Profile description:

0 to 5 inches, brownish-gray mellow silt loam splotted with gray and rust brown or light gray; 0 to 10 inches thick.

5 to 35 inches, friable silt loam or heavy silt loam mottled with gray, rust brown, or brown; 15 to 30 inches thick.

35 inches +, fine sandy loam or silt loam mixed with alluvium; stratified layers of silt and sand in places; 2 to 10 feet or more thick.

Surface drainage is very slow, and most of the soil is subject to periodic overflow. The soil is permeable, but its water table is at or near the surface a large part of the time. The soil is strongly to very strongly acid and moderately high in organic matter and mineral plant nutrients.

A few small permanently swampy areas are mapped with this soil. Also, because of small size and intricate association with this soil, small areas of Beechy fine sandy loam and Hymon silt loam are included. Use and management of these included areas do not differ significantly from those for Beechy silt loam.

Present use and management.—About 40 percent of Beechy silt loam is cleared, and of this about 20 percent is in corn, 25 percent in pasture, and 30 percent in hay. About 25 percent of the cleared land is idle. Fertilization or rotation of crops is not common. Some areas have been drained by open ditches, but tile drainage has not been attempted. Hay yields are fairly constant, but corn yields are highly variable. In dry seasons corn yields are good, but in wet seasons the crop is commonly a total failure. Pasture grows well but is of low quality.

Use and management requirements.—In its present poorly drained state, Beechy silt loam is poorly suited to row crops but well suited to pasture and some hay crops (pl. 3, B). If adequately drained, corn can be successfully grown on this soil, but the flood hazard cannot be entirely eliminated. Excellent pastures can be produced by using lime and phosphate. White clover, alsike clover, lespedeza, tall fescue, redbud, and Bermuda grass for hay and pasture grow successfully. Most areas will respond to artificial drainage, but difficult engineering problems are involved and drainage therefore may not be practicable.

Beechy fine sandy loam (1-3% slopes) (B_A).—This poorly drained first bottom soil occurs in close association with Hymon, Briensburg,

and Eupora soils and with other Beechy soils, chiefly on narrow flood plains in highly dissected areas. Comparatively, it has the same position on the flood plains as the Ruston soils have in the uplands. It also occurs in long narrow areas along streams in the broad first bottoms. It differs from Beechy silt loam principally in having a proportion of sandy material.

The soil has formed from mixed alluvium that washed from upland soils derived from wind-blown silt and Coastal Plain sand and clay. It developed under a deciduous forest consisting chiefly of water-tolerant trees. This soil is young and does not have well-developed textural horizons.

Profile description :

- 0 to 8 inches, brownish-gray or light-gray loose fine sandy loam splotched with light gray and rust brown ; 4 to 10 inches thick.
- 8 to 30 inches, very friable fine sandy loam mottled with gray, rust brown, and light brown ; 15 to 30 inches thick.
- 30 inches +, highly mottled sandy alluvium, stratified in many places ; 2 to 10 feet thick.

Surface drainage is very slow, and most areas are very susceptible to overflow. The soil is strongly to very strongly acid and moderately high in organic matter and plant nutrients. It is permeable, but the water table is at or near the surface much of the time.

Part of the soil included with Beechy fine sandy loam has poor drainage caused by seepage from adjacent upland slopes. These seepage areas have fair surface drainage in most places and are better suited to crops than the areas having very slow surface drainage.

Present use and management.—About 60 percent of Beechy fine sandy loam has been cleared. This is a considerably greater area than has been cleared on Beechy silt loam. About 15 percent of the cleared land is idle. Crop yields are somewhat less variable than on Beechy silt loam, but yields are not so high in favorable seasons.

Use and management requirements.—Under present drainage hay or pasture is probably the best use for Beechy fine sandy loam. Most areas would have a wider use suitability if they were artificially drained, but the expense of draining may not be justified. Artificial drainage will not eliminate the overflow hazard. Drained areas will grow corn successfully, but occasionally crops will be lost when streams overflow. Good to excellent hay and pasture can be produced on the soil. Lime and phosphate probably will be needed to establish and maintain pastures or meadows. Potash will also be needed on some areas. Pastures of white clover, alsike clover, lespedeza, redtop, tall fescue, and Bermuda grass can be grown successfully.

Bodine cherty silt loam, hilly phase (12-30% slopes) (B_D).—One of the more extensive soils in the county, this phase is widely distributed throughout the Limestone Hills section, chiefly on the slopes of the narrow winding ridges in association with Dickson, Greendale, Humphreys, and Ennis soils.

The soil developed from the residuum of cherty limestone under a deciduous forest vegetation. Post and blackjack oaks are the most common trees on the upper slopes ; white and red oaks and hickory are common on the lower slopes.

The soil is shallow, excessively drained, and weakly developed; it varies considerably in profile characteristics.

Profile description:

0 to 8 inches, brownish-gray cherty silt loam; 5 to 12 inches thick.

8 to 18 inches, brownish-yellow friable cherty silt loam or cherty silty clay loam; 0 to 18 inches thick.

18 inches +, very cherty silty clay loam highly mottled with red, yellow, gray, and brown; 5 feet or more thick.

The soil varies considerably within short distances, especially in the degree to which surface soil and subsoil layers have developed. In many places, especially at the foot of slopes where some colluvial material has accumulated, the surface layer is as much as 15 inches deep. Small areas that have a moderately well developed textural profile were included in mapping.

The soil is strongly to very strongly acid and low in fertility and organic matter. It has many angular chert fragments on the surface and throughout the profile. The number of chert fragments in the soil varies considerably, but in most places there are enough to interfere materially with cultivation. In many places the parent material includes a small quantity of wind-blown silt, which may influence the texture of the surface soil to some extent. The soil is very permeable to air, roots, and moisture. External and internal drainage are rapid or very rapid. The water-holding capacity is low.

Present use and management.—Most areas of this soil are covered with forest that has been cut over so many times that the stand contains little marketable timber. The majority of the areas are burned over frequently, and many of them are grazed.

Use and management requirements.—Chiefly because of low fertility, low water-holding capacity, chertiness, and strong slopes, this soil is very poorly suited to tilled crops (pl. 3, C). It is not naturally productive of pasture but good pasture can be established and maintained if management is good. Lime and phosphate should be applied in establishing the pasture mixture, and a top dressing of phosphate should be added each year. The expense of clearing away the forest may not be justified by the low carrying capacity of the pastures established; many areas are probably best left in forest. The management of forested areas is concerned chiefly with increasing the yield and quality of timber.

Bodine cherty silt loam, eroded hilly phase (12-30% slopes) (Bc).—This phase differs from Bodine cherty silt loam, hilly phase, chiefly in being eroded. It is an excessively drained shallow soil characterized by a large number of angular chert fragments on the surface and throughout the profile. The comparatively small areas are on ridge slopes scattered throughout the Limestone Hills section. The soil is associated chiefly with the Dickson soils of the uplands, Greendale soils of the colluvial lands, Humphreys soils of the low terraces, and Ennis soils of the bottom lands.

The soil developed under a deciduous forest vegetation, its parent material consisting of the residuum from very cherty limestone. It does not have a well-developed textural profile.

Profile description:

0 to 6 inches, brownish-gray to yellowish-gray friable cherty silt loam or cherty silty clay loam; 0 to 10 inches thick.

6 to 16 inches, brownish-yellow or yellowish-brown friable cherty silt loam or cherty silty clay loam; 0 to 18 inches thick.

16 inches +, very cherty silty clay loam highly mottled with red, yellow, gray, and brown; 5 feet or more thick.

The soil varies within short distances in degree of the textural development and thickness of the surface soil and subsoil layers. The thickness of the surface soil is also variable because material has been lost through accelerated erosion. In some places so much of the original surface soil has been lost that the subsoil is reached by tillage implements. During tillage subsoil is mixed with remnants of original surface layer to form a yellowish plow layer.

Chert fragments have accumulated on the surface, and the soil therefore appears to contain more chert than uneroded Bodine cherty silt loam. Chert in the plow layer materially interferes with tillage. The soil is strongly to very strongly acid and low in organic matter, plant nutrients, and water-holding capacity.

Present use and management.—All of this soil has been cleared and used for field crops, but except for some areas used for pasture, most of it is now wasteland or lies idle. In most places the soil was cleared and planted to row crops until yields became so low as to be unprofitable. It was then abandoned or left as unimproved pasture. The yields of both crops and pasture are very low under common management practices. Crop fertilization and rotation are not common.

Use and management requirements.—This soil is very poorly suited to intertilled field crops. It is suited to pasture, but it is not naturally productive of forage. Lime and phosphate are necessary for the establishment and maintenance of pasture. Even under good management, pasture yields are low. The growth of pasture plants is greatly retarded during summer and fall, which are the dry seasons, chiefly because the water-holding capacity of the soil is low.

Bodine cherty silt loam, severely eroded hilly phase (12–30% slopes) (Br).—Small areas of this soil are widely distributed on ridge slopes throughout the Limestone Hills section in association with other Bodine soils and soils of the Dickson, Greendale, Humphreys, and Ennis series. The soil has developed from the residuum of cherty limestone. It is cherty throughout, but because erosion has removed the finer particles, more chert has accumulated on the surface.

Profile description:

0 to 6 inches, brownish-gray to grayish-yellow friable very cherty silt loam; 0 to 8 inches thick.

6 to 16 inches, brownish-yellow or yellowish-brown friable cherty silt loam or cherty silty clay loam; 0 to 18 inches thick.

16 inches +, cherty silty clay loam highly mottled with red, yellow, gray, and brown; 5 feet or more thick.

Erosion has removed most of the original surface layer and, in places, a part of the subsoil. Shallow gullies and exposure of the subsoil are common. The surface layer is highly variable in color and thickness because of uneven erosion losses and the mixture of the subsoil with remnants of the surface soil.

The soil is strongly to very strongly acid and very low in organic matter, plant nutrients, and water-holding capacity. External and internal drainage are rapid to very rapid.

About half of the total acreage contains less chert than typical, and areas having remnants of the original surface soil are relatively chert-

free. Most of the original surface soil, however, has been removed by erosion. The use and management of the variations are not significantly different from those suitable for the rest of the phase.

Present use and management.—All of Bodine cherty silt loam, severely eroded hilly phase has been cleared and used for crops or pasture. At present, however, most of the soil is temporarily idle or abandoned. A few areas are in unimproved pasture, which produces very low yields.

Use and management requirements.—The phase is very poorly suited to tilled crops and poorly suited to pasture. In its present state, it is probably best suited to woodland. Reforestation will prove difficult. Construction of check dams and diversion ditches, contour furrowing, mulching, and some fertilization will probably be necessary before the soil can be reforested. In areas thus prepared, shortleaf, and loblolly pines make a fair growth; black locust grow well in the fill material behind check dams.

Bodine cherty silt loam, steep phase (30+ % slopes) (Bg).—This phase, one of the most extensive in the county, occurs in large areas throughout the Limestone Hills section. It is associated chiefly with other Bodine soils. From Bodine cherty silt loam, hilly phase, it differs mainly in having a steeper slope, but it is also more variable, especially in thickness of the surface soil and subsoil layers, both of which are more poorly defined. The soil has developed from the residuum of highly cherty limestone under a deciduous forest vegetation.

Profile description :

0 to 8 inches, brownish-gray friable cherty silt loam ; 6 to 12 inches thick.

8 to 16 inches, brownish-yellow or brownish-gray friable cherty silt loam or silty clay loam ; 0 to 15 inches thick.

16 inches +, very cherty silty clay loam highly mottled with red, yellow, gray, and brown ; 5 feet or more thick.

The soil is very permeable. Internal and external drainage are rapid to very rapid. Considerable chert occurs on the surface and throughout the profile. The fragments range from 1 to 3 inches in diameter and in most places are sharply angular. The soil is low in organic matter, plant nutrients, and water-holding capacity.

Present use and management.—Practically all of Bodine cherty silt loam, steep phase, is in forest. Some small areas adjacent to open cropland and pasture land are cleared and used for pasture. Pastures produce very low yields, even under good management.

Use and management requirements.—Steep slopes, chertiness, low fertility, and low water-holding capacity make this soil unsuited to tilled crops and poorly suited to pasture. It is best used as woodland, but some farmers may be forced to use it for pasture. If so, the north- and east-facing slopes are more productive of pasture than the south- and west-facing slopes, and lower slopes are generally more productive than the upper. Lime, phosphate, and possibly potash are needed to establish and maintain fair pastures.

Bodine cherty silt loam, rolling phase (5-12% slopes) (Be).—This very cherty soil occurs in long winding areas, chiefly on narrow ridge crests in the highly dissected Limestone Hills section. It is associated with other Bodine soils. It differs from Bodine silt loam, rolling phase, chiefly in having more chert in the plow layer. The

soil has developed from the residuum of cherty limestone. The deciduous forest vegetation under which it developed consists chiefly of post and blackjack oaks.

Profile description:

0 to 8 inches, brownish-gray friable cherty silt loam; 6 to 10 inches thick.
8 to 20 inches, brownish-yellow friable cherty silty clay loam; 10 to 20 inches thick.

20 inches +, cherty silty clay loam highly mottled with gray, red, yellow, and brown; 10 feet or more thick.

All of the profile is cherty; chert in the plow layer interferes materially with tillage.

The soil is very permeable. Internal drainage is rapid; external drainage is moderate. The water-holding capacity is low. The soil is low in organic matter and plant nutrients and is strongly to very strongly acid.

Included with this soil in mapping are some small areas with well-developed surface soil and subsoil layers. These are similar to the Nixa soils in nearby counties but were not separated because of their small size. Also included are a few small areas of Bodine silt loam.

Present use and management.—Practically all areas of the rolling phase of Bodine cherty silt loam are still forested, but the land has been cut over a number of times and the stands now contain very little marketable timber. The trees are of poor quality and grow very slowly. Most of the forests are burned over every few years, and cattle graze many areas.

Use and management requirements.—Chiefly because of its chertiness, low fertility, and low water-holding capacity, this phase is poorly suited to crops. Also, it is located on narrow winding ridges in association with soils not suited to cultivation. Many areas are hard to get to and irregularly shaped. Under good management, which includes adequate fertilization and a careful crop selection, fair yields can be produced. Lime, phosphate, and possibly potash are needed for practically all crops. Nitrogen fertilizer will be needed for all crops except legumes and the crop immediately following legumes. The crops selected should be drought-resistant kinds able to grow on soils of low water-holding capacity or they should be those that mature in seasons of high rainfall.

This soil is probably better suited to pasture than tilled crops. Reasonably good pastures can be established and maintained if lime and phosphate are applied. Because the soil dries out rapidly after rains, especially in hot weather, pasture plants will not grow much late in summer and early in fall. If the soil is properly fertilized, pastures should produce at a fairly high level in spring.

Bodine silt loam, rolling phase (5-12% slopes) (Bm).—Small areas of this soil occupy ridge crests or ridge slopes throughout the Limestone Hills section; most of them are in the less highly dissected parts and closely associated with Dickson and Greendale soils and other Bodine soils. The soil has developed under deciduous forest from cherty limestone residuum with which some loess has been admixed. It differs from Bodine cherty silt loam, rolling phase, chiefly in having a relatively chert-free plow layer, and from Dickson silt

loam, rolling phase, in having a thinner chert-free layer and no siltpan.

Profile description :

0 to 8 inches, grayish-yellow to yellowish-gray mellow silt loam; 6 to 12 inches thick.

8 to 24 inches, brownish-yellow friable cherty light silty clay loam; 10 to 15 inches thick.

24 inches +, very cherty silt loam highly mottled with red, yellow, gray, and brown; 5 feet or more thick.

The soil is strongly to very strongly acid and low in organic matter and plant nutrients. It is fairly low in water-holding capacity but permeable to air, roots, and water. External and internal drainage are moderate. The surface layer may contain some chert, usually not enough to interfere materially with cultivation. In most places the subsoil contains many angular chert fragments.

This soil is in many characteristics transitional between Bodine cherty silt loam, rolling phase, and Dickson silt loam, rolling phase. In many places, also, it is between these soils geographically. In consequence, many areas of this soil include small areas of those soils between which it occurs.

Present use and management.—Practically all of Bodine silt loam, rolling phase, is still forested, but it has been cut over and now has little marketable timber. The trees grow slowly, and yields are low.

Use and management requirements.—The soil is inherently fairly well suited to crops, but a large part of it occurs in long narrow areas isolated by large areas of Bodine cherty silt loam, steep phase. Also, it is highly susceptible to severe erosion.

A long rotation consisting chiefly of close-growing crops and including grasses and legumes is desirable. Most crops will need lime, phosphate, and potash. Except for legumes and the crop immediately following them, all crops will need nitrogen. Special practices for controlling runoff and erosion should not be necessary if a long rotation is used. Row crops should be farmed on the contour. Terraces may be necessary on some ridge slopes, but they should not be needed on ridge crests.

Bodine silt loam, eroded rolling phase (5-12% slopes) (B_k).—This well-drained soil has developed under deciduous forest from cherty limestone residuum and a small admixture of loess. It occurs mainly in the less dissected parts of the Limestone Hills section. In most places it is on the ridge slopes below Dickson silt loam, undulating phase. Some areas, however, are on ridge crests and are associated with Bodine cherty silt loam, rolling phase. The soil differs from Bodine silt loam, rolling phase, chiefly in being eroded. Other differences are the thinness of the chert-free layer and the presence of scattered chert fragments on the surface and in the plow layer.

Profile description :

0 to 6 inches, grayish-yellow mellow silt loam; 0 to 8 inches thick.

6 to 24 inches, brownish-yellow friable cherty light silty clay loam; 10 to 15 inches thick.

24 inches +, cherty silt loam highly mottled with red, yellow, gray, and brown; 5 feet or more thick.

A part of the original surface soil has been eroded away, and the remaining surface soil varies in thickness. Small areas of exposed

subsoil are common. In more eroded areas some angular chert fragments occur in the plow layer.

The soil is permeable to air, roots, and water but low in supplies of organic matter and plant nutrients and low in water-holding capacity. It is strongly to very strongly acid. Internal and external drainage are moderate.

Included with this phase in mapping are some areas with enough chert in the plow layer to interfere materially with cultivation. This variation makes up about one-fourth of the total acreage. Small areas having a chert-free layer thicker than normal for this soil are also included. These inclusions do not significantly change use and management requirements.

Present use and management.—All of Bodine silt loam, eroded rolling phase, has been cleared and cropped. Most of it is now used for either crops or pasture. Crops are not systematically rotated, nor is fertilization commonly practiced. Under common management corn yields about 14 bushels; cotton, 200 pounds; and lespedeza hay 0.6 ton.

Use and management requirements.—This soil is suitable for crops but very susceptible to severe erosion. It is also low in organic matter and plant nutrients and strongly to very strongly acid. If cropped, it probably should be kept in a long rotation consisting chiefly of close-growing crops. The soil will erode if left bare for extended periods; it should be sown to a cover crop as soon as possible after the row crop is removed.

Lime, phosphate, and probably potash are needed for most crops. Nitrogen fertilizers will be needed for all crops except legumes and crops immediately following legumes. The response obtained from fertilization is good but does not last long. Cultivation should be on the contour; contour strip cropping should be considered for the long slopes. Terraces may be necessary in places to control runoff and erosion, but terracing should not be needed if other management practices are adequate. Under good management anticipated acre yields are 20 bushels of corn, 320 pounds of cotton, and 1 ton of lespedeza hay.

Bodine silt loam, hilly phase (12-30% slopes) (BL).—This phase is widely distributed throughout the Limestone Hills section; it occupies ridge slopes, chiefly in the less highly dissected parts. In most places it lies below Bodine silt loam, rolling phase, or Dickson silt loam, undulating phase. It differs from Bodine silt loam, rolling phase, chiefly in having steeper slopes, but its chert-free layer is also thinner on the average and in many places its surface layer contains some chert.

The soil has developed under deciduous forest, predominantly oaks, from cherty limestone residuum and a small admixture of loess.

Profile description:

- 0 to 8 inches, grayish-yellow to yellowish-gray mellow silt loam; 6 to 12 inches thick.
- 8 to 20 inches, brownish-yellow friable cherty light silty clay loam; 8 to 12 inches thick.
- 20 inches +, very cherty silt loam highly mottled with red, yellow, gray, and brown; 5 feet or more thick.

The surface layer may contain some chert but not enough to interfere materially with cultivation. In most places the subsoil contains many chert fragments.

This soil is strongly to very strongly acid, low in organic matter and plant nutrients; and fairly low in water-holding capacity. It is permeable to air, roots, and water. Internal drainage is moderate; external drainage, rapid.

Present use and management.—Practically all of Bodine silt loam, hilly phase, is still in cut-over forest. The trees, small and of poor quality, grow slowly and yield little marketable timber.

Use and management requirements.—The phase is poorly suited to tilled crops, chiefly because of low fertility and susceptibility to erosion. It is not naturally productive of pasture, but fair pastures probably can be established and maintained by good management, which would include application of lime, phosphate, and possibly potash. Nitrogen fertilizer may also be necessary in establishing the stand.

Bodine silt loam, eroded hilly phase (12–30% slopes) (BH).—Erosion losses differentiate this soil from Bodine silt loam, hilly phase. It occurs chiefly in the less highly dissected parts of the Limestone Hills section, in most places on ridge slopes below Bodine silt loam, eroded rolling phase, or Dickson silt loam, eroded rolling phase. Part of the surface soil, including the thin surface layer of high organic-matter content, has been eroded away. The soil has developed from cherty limestone residuum containing a small admixture of loess.

Profile description:

0 to 6 inches, grayish-yellow mellow silt loam.

6 to 20 inches, brownish-yellow friable cherty light silty clay loam; 8 to 12 inches thick.

20 inches +, cherty silt loam highly mottled with gray, yellow, red, and brown; 5 feet or more thick.

The present surface soil varies in thickness; small areas of exposed subsoil are common. The more eroded spots have some chert fragments in the surface layer.

The soil is permeable; strongly to very strongly acid; and low in organic matter, plant nutrients, and water-holding capacity. Internal drainage is moderate; external drainage, rapid.

Present use and management.—All of Bodine silt loam, eroded hilly phase, has been cleared and at some time used for common field crops, but most of it is now either idle or in pasture. The pastures are unimproved and have a low carrying capacity. Crops are not systematically rotated, and the small acreage used for crops is not generally fertilized. In most places the soil is cropped continuously to corn or other intertilled crops until yields become very low and is then abandoned or fenced and used for pasture.

Use and management requirements.—This phase is poorly suited to crops, chiefly because of its low fertility and susceptibility to erosion. When the soil is adequately fertilized, fair pastures can be established and maintained. Lime, phosphate, and potash will be needed to establish a good pasture mixture. Clover should be included in the pasture mixture, but even with this nitrogen-producing legume, nitrogen fertilizer will be needed in some places to establish the pasture stand.

Bodine silty clay loam, severely eroded rolling phase (5-12% slopes) (B_N).—Small areas of this soil are widely distributed throughout the Limestone Hills section. The parent material is cherty limestone residuum with a small admixture of loess. Soil development took place under deciduous forest.

Profile description:

- 0 to 4 inches, grayish-yellow friable silt loam or silty clay loam; 0 to 8 inches thick.
- 4 to 22 inches, brownish-yellow friable cherty light silty clay loam; 10 to 15 inches thick.
- 22 inches +, cherty silt loam highly mottled with red, yellow, gray, and brown; 5 feet or more thick.

Erosion has removed most of the original surface layer, so the present surface layer consists of remnants of the original surface layer mixed with the upper part of the subsoil. Because the surface layer has not been uniformly eroded, some places have the plow layer entirely within the original surface layer. The texture of the present surface layer ranges from silt loam to light silty clay loam, depending on the extent of erosion. Even underlying cherty layers are exposed in many places. Shallow gullies that have penetrated the subsoil are common.

The soil is strongly to very strongly acid, low in organic matter and plant nutrients, and very low in water-holding capacity. Included with this phase are a few small areas where chert fragments in the surface layer interfere materially with cultivation. Small areas with a thicker chert-free layer are also included. In some places this chert-free variation has a siltpan.

Present use and management.—All of Bodine silty clay loam, severely eroded rolling phase, has been cleared and cropped at some time, but most of it is now idle or in pasture. The pastures are unimproved and have very low carrying capacity.

Use and management requirements.—This soil has been severely damaged by erosion and is poorly suited to crops and pasture. Under present conditions it probably is best used for pasture. Lime, phosphate, and possibly potash will be needed to establish and maintain a good pasture mixture. Manuring or mulching of the more eroded areas will aid in establishing the pasture stand, which should include legumes. Even so, applications of nitrogen fertilizer will be necessary to start the pasture. The carrying capacity will probably be low, even if pasture management is good.

Briensburg silt loam (2-5% slopes) (B_o).—The locations of this imperfectly drained soil formed from colluvium or local alluvium are (1) gently sloping alluvial fans of small streams emerging onto large flood plains, (2) gently sloping areas at the base of upland slopes, (3) or along narrow gently sloping drainageways. Most of the areas are in the Loess Plains section, but some are scattered through all parts of the county. The areas are small and associated with Dulac, Timpah, and Dickson soils of uplands, Paden and Freeland soils of terrace lands, Tigrett soil of colluvial lands, and Hymon soils of bottom lands. The colluvium from which the soil formed has washed from uplands where the soils are derived from loess. Soil development took place under a deciduous forest. The soil is young and therefore has little, if any, textural profile development.

Profile description:

0 to 10 inches, grayish-brown mellow silt loam; 6 to 16 inches thick.

10 to 16 inches, light-brown friable silt loam; 0 to 6 inches thick.

16 inches +, friable silt loam mottled with rust brown, gray, and light brown; 1 to 8 feet thick.

All of the soil is strongly to very strongly acid. The organic-matter content, though variable from place to place, is normally moderately high. The supply of plant nutrients is moderate to low. Surface drainage is moderate, but internal drainage is slow. The water-holding capacity is high. The soil is free of stone and gravel but in a few places includes a small quantity of chert. It varies considerably in degree of profile development and drainage. Some included areas have fairly well developed textural profiles.

About one-third of the acreage, which has developed from material washed from Dickson soils, is somewhat better drained than normal and in many places contains an appreciable quantity of chert fragments.

Present use and management.—Most of Briensburg silt loam is cleared and used for crops. An estimated 50 percent is used for corn, 5 percent for cotton, and 30 percent for miscellaneous crops. About 15 percent is in woods or is idle open land. The soil is managed like the adjacent bottom land, and in many places it is part of a bottom land field. Crops are not rotated; fertilization is a common practice only for cotton. Under common management corn yields about 25 bushels; cotton, 240 pounds; and lespedeza hay, 1.1 ton an acre.

Use and management requirements.—This soil is physically suited to crops, but its usefulness is somewhat limited by imperfect internal drainage. Compared with the associated upland soils, it is productive of the crops to which it is adapted. Crop yields, though comparatively high, can be increased easily by improved management.

The soil is suited to intensive cropping, but can be maintained highly productive more easily if a short rotation that includes a legume is used. Lime, phosphate, and potash are needed for the legume crop. Complete fertilizer will be needed for other crops in the rotation. Applications of potash help reduce the prevalence of rust on cotton. The soil is not especially susceptible to erosion, but diversion ditches at the base of the upland slopes improve drainage and prevent overwash from eroded slopes. Under good management corn yields 45 bushels; cotton, 380 pounds; and lespedeza hay, 1.2 tons an acre.

Bruno fine sandy loam (0-3% slopes) (B_F).—The long narrow areas of this well-drained soil occur chiefly on low natural levees in first bottoms of the Tennessee River. They are associated with Huntington, Lindside, Melvin, Sequatchie, and Wolftever soils.

The soil has formed from mixed alluvium washed predominantly from upland soils underlain by sandstone or unconsolidated sands. It has developed under a forest consisting primarily of oak, elm, beech, maple, ash, and sycamore. It is nearly level to very gently sloping. Surface drainage is moderate, but internal drainage is moderate to rapid. The soil is young and has very little horizon differentiation.

Profile description :

- 0 to 12 inches, grayish-brown or light-brown loose fine sandy loam; 6 to 14 inches thick.
- 12 to 36 inches, light-brown fine sandy loam; 10 to 30 inches thick.
- 36 inches +, sandy alluvium; stratified silt and sand in places; 10 feet or more thick.

The soil is slightly acid, very permeable to air, roots, and water, and free of stones or gravel. In comparison with other soils of the county it is high in organic matter and plant nutrients. The water-holding capacity is moderately high, however, and the soil is subject to periodic flooding.

The soil varies considerably in crop suitability and productivity because slightly lower lying areas were included in mapping. These lower areas have somewhat more organic matter and plant nutrients and consequently produce somewhat better yields, but they are more subject to flooding and somewhat limited in use suitability.

Present use and management.—Most of Bruno fine sandy loam is cleared. It is used chiefly for corn and hay crops. A total of 559 acres is now flooded by the Kentucky Reservoir. Peanuts are grown on a small acreage in the northern part of the county. Corn and hay crops are not systematically rotated. The immediate needs of the farmer usually determine which crop is grown. Practically no fertilizer is used. Under common management corn yields 35 bushels an acre, and lespedeza hay, 1.5 tons.

Use and management requirements.—Because it may be flooded during winter and in spring, this soil is best suited to summer annuals. It is well suited to corn, which produces good yields year after year. Corn yields better if it is rotated with a legume hay crop such as lespedeza or soybeans. Fertilization is not practiced, but use of phosphate and nitrogen on areas less frequently flooded should bring increased yields.

Bruno loamy fine sand (0-3% slopes) (Br).—This extremely sandy soil occurs as long narrow areas on the high natural levees along the Tennessee River. It is associated with Huntington, Lindside, Melvin, Sequatchie, and Wolftever soils. The mixed general alluvium from which it has formed washed chiefly from upland soils underlain by sandstone or unconsolidated sand. The soil developed under a deciduous forest. Surface drainage is moderate, but internal drainage is very rapid. This is a young soil without clearly defined horizons.

Profile description :

- 0 to 26 inches, light-brown or grayish-brown loose loamy fine sand; 20 to 30 inches thick.
- 26 inches +, stratified sandy alluvium; 10 feet or more thick.

The soil is strongly acid, low in organic matter and plant nutrients, and very low in water-holding capacity. It is extremely permeable to air, water, and roots. Surface drainage is moderate, and internal drainage is very rapid.

Present use and management.—A total of 161 acres of Bruno loamy fine sand is covered by the Kentucky Reservoir. Most of the rest is cleared and used for crops, principally corn, lespedeza, and peanuts. Crops are not systematically rotated, and no fertilizers are used. Ex-

pected acre yields under the common management are 18 bushels of corn, 500 pounds of peanuts, and 0.4 ton of lespedeza hay.

Use and management requirements.—The soil is suited to crops but has low productivity, chiefly because its water-holding capacity is low. A short rotation that includes a legume to be turned under will increase the supply of nitrogen, which is apparently the element most needed in many places. Most crops need phosphate, and possibly potash. Moderate amounts of fertilizers frequently applied are desirable, for the soluble elements in fertilizer rapidly leach from this soil.

Cuthbert-Luverne fine sandy loams, hilly phases (12–30% slopes) (Cc).—This complex is made up of areas of the hilly phases of Cuthbert fine sandy loam and Luverne fine sandy loam that are so small and intricately associated that they cannot be separated on a map of this scale. Cuthbert soil makes up 60 percent of the area; Luverne soil, 40 percent. The complex occupies small areas in the southern part of the Coastal Plain section in association with Dulac, Savannah, Ruston, Safford, Eupora, and Hymon soils.

The soils have developed from the residuum of unconsolidated sandy clays that have thin layers of gray clay. They have developed under deciduous forest consisting chiefly of blackjack, post, red, and white oaks. The slopes are relatively long and regular as compared to the short, choppy, and abrupt slopes of the Cuthbert-Savannah complex.

Profile descriptions:

Cuthbert fine sandy loam, hilly phase:

0 to 8 inches, gray loose fine sandy loam; 5 to 12 inches thick.

8 to 24 inches, strongly plastic reddish-yellow clay highly mottled with red, yellow, and gray; 10 to 20 inches thick.

24 inches +, reddish-yellow sandy clay having thin layers of bluish-gray clay.

Luverne fine sandy loam, hilly phase:

0 to 8 inches, grayish-yellow loose fine sandy loam; 5 to 12 inches thick.

8 to 24 inches, red or brownish-red strongly plastic clay; 10 to 20 inches thick.

24 to 40 inches, brownish-red plastic clay spotted with yellow; 8 to 20 inches thick.

40 inches +, brownish-red sandy clay having thin layers of bluish-gray clay.

These soils are strongly to very strongly acid and low in organic matter, plant nutrients, and water-holding capacity. Ferruginous sandstone fragments are commonly on the surface and throughout the profiles. The soils are only slightly permeable to air, roots, and water. External drainage is rapid, but internal drainage is slow.

Present use and management.—Practically all of Cuthbert-Luverne fine sandy loams, hilly phases, is in forest that has been cut over several times and now consists largely of small unmarketable trees. Trees grow very slowly on these soils.

Use and management requirements.—The soils of the complex are not suitable for crops and very poorly suitable for pasture. They are probably best used for forest, even though trees grow very slowly. The chief aim in management should be that of increasing the yield and quality of timber.

Cuthbert-Luverne clay loams, eroded hilly phases (12–30% slopes) (CA).—This mapping unit consists of complexly associated areas of Cuthbert clay loam, eroded hilly phase, and Luverne clay loam, eroded hilly phase. Cuthbert soils cover about 60 percent of

the total area, Luverne soils, 40 percent. The complex occurs in small areas widely distributed throughout the southwestern part of the Coastal Plain section of the county. The soils have developed from the residuum of heavy-textured Coastal Plain materials under a deciduous forest vegetation.

Profile descriptions:

Cuthbert clay loam, eroded hilly phase:

0 to 6 inches, grayish-yellow friable clay loam; 0 to 8 inches thick.

6 to 22 inches, strongly plastic reddish-yellow clay highly mottled with red, yellow, and gray; 10 to 20 inches thick.

22 inches +, reddish-yellow sandy clay having thin layers of bluish-gray clay.

Luverne clay loam, eroded hilly phase:

0 to 6 inches, reddish-yellow or grayish-yellow friable clay loam; 0 to 8 inches thick.

6 to 22 inches, brownish-red strongly plastic clay; 10 to 20 inches thick.

22 to 38 inches, brownish-red plastic clay splotched with yellow; 8 to 20 inches thick.

38 inches +, brownish-red sandy clay with thin layers of bluish-gray clay.

In large part the original surface layers have been eroded from these soils. The present surface layers are mixtures of remnants of the original surface layers with the upper parts of the subsoils. Removal of material has not been uniform, and in some places all of the original surface layers and part of the subsoils are removed, in other places only a small part of the surface layers is missing.

These soils are strongly to very strongly acid, very low in organic matter and plant nutrients, and low in water-holding capacity. Ferruginous sandstone fragments are common on the surface and throughout the profiles. The soils are only slightly permeable.

Present use and management.—All of Cuthbert-Luverne clay loams, eroded hilly phases, has been cleared and used for crops, but most areas are now abandoned or in unimproved pasture. They give very low crop and pasture yields and poor response to good management.

Use and management requirements.—The soils of the complex are not suitable for crops or pasture because they have low fertility, unfavorable tilth, and low water-holding capacity and are susceptible to erosion. They are best suited to forestry, though reforestation will be difficult.

Cuthbert-Luverne clay loams, severely eroded hilly phases (12–30% slopes) (C_B).—This is an intricate geographic association of Cuthbert clay loam, severely eroded hilly phase, and Luverne clay loam, severely eroded hilly phase. The complex occurs chiefly in the southern part of the Coastal Plain section. The soils have developed from unconsolidated sandy clay that contains thin layers of gray clay.

Profile descriptions:

Cuthbert clay loam, severely eroded hilly phase:

0 to 4 inches, grayish-yellow or reddish-yellow moderately plastic clay loam; 0 to 6 inches thick.

4 to 20 inches, strongly plastic reddish-yellow clay highly mottled with red, yellow, and gray; 10 to 20 inches thick.

20 inches +, reddish-yellow sandy clay with thin layers of bluish-gray clay.

Luverne clay loam, severely eroded hilly phase:

0 to 4 inches, reddish-yellow or yellowish-red moderately plastic clay loam; 0 to 6 inches thick.

- 4 to 20 inches, brownish-red strongly plastic clay; 10 to 20 inches thick.
 20 to 36 inches, brownish-red plastic clay spotted with yellow; 8 to 20 inches thick.
 36 inches +, brownish-red sandy clay with thin layers of bluish-gray clay.

These soils have lost most of their original surface layers through erosion, and shallow gullies are common. The exposed red Luverne subsoil is conspicuous in areas of this complex. The present surface layers consist of the upper part of the subsoils, with a small admixture of the original surface soils in places.

These soils are strongly to very strongly acid and very low in organic matter, plant nutrients, and water-holding capacity. Surface drainage is very rapid, and internal drainage is slow. The soils are only slightly permeable. Sandstone fragments are common on the surface and throughout the profile.

Present use and management.—All of Cuthbert-Luverne clay loams, severely eroded hilly phases, has been cleared and used for crops, but practically all areas are now wasteland. Very few of the abandoned areas have been reforested, and the erosion has not been stabilized in many places.

Use and management requirements.—Cuthbert-Luverne clay loam, severely eroded hilly phases, are very poorly suited to crops or pasture. They are also poorly suited to forests, but are probably best used for that purpose.

Cuthbert-Savannah fine sandy loams, hilly phases (12–30% slopes) (Cf).—This complex is widely distributed throughout the Coastal Plain section. It consists of areas of Cuthbert fine sandy loam, hilly phase, and Savannah fine sandy loam, hilly phase, so intricately associated that it is impracticable to show them separately on the map. The Cuthbert soil covers about 70 percent of the total area; the Savannah soil, about 30 percent. The soils have developed from unconsolidated sandy clays of the Coastal Plain under a deciduous forest vegetation.

Profile descriptions:

Cuthbert fine sandy loam, hilly phase:

- 0 to 8 inches, gray loose fine sandy loam; 6 to 12 inches thick.
 8 to 24 inches, strongly plastic reddish-yellow clay highly mottled with red, yellow, and gray; 10 to 20 inches thick.
 24 inches +, reddish-yellow sandy clay with thin layers of bluish-gray clay.

Savannah fine sandy loam, hilly phase:

- 0 to 8 inches, yellowish-gray fine sandy loam; 6 to 10 inches thick.
 8 to 24 inches, yellowish-brown or brownish-yellow friable clay loam; 16 to 22 inches thick.
 24 to 42 inches, compact clay loam highly mottled with red, yellow, brown, and gray; 12 to 18 inches thick.
 42 inches +, brownish-red to reddish-yellow sandy clay spotted and streaked with yellow.

These soils are strongly to very strongly acid and low in plant nutrients, water-holding capacity, and organic matter. External drainage is rapid, and internal drainage is slow. Some small sandstone fragments occur on the surface and throughout the soils but do not interfere materially with cultivation.

Present use and management.—Practically all areas of Cuthbert-Savannah fine sandy loams, hilly phases, are still in forest that has

been cut over and contains little marketable timber. The trees are chiefly blackjack and post oaks, which grow very slowly.

Use and management requirements.—The soils of this complex are very poorly suited to crops or pasture. The Cuthbert soil is poorly suited because of its steep slope, low fertility, and high susceptibility to erosion. The Savannah soil is physically suitable for crops, but occurs in such small areas that it is not practical to cultivate it in most places. This complex is probably best used for forest, so management will be concerned chiefly with increasing the yield and quality of timber.

Cuthbert-Savannah clay loams, eroded hilly phases (12–30% slopes) (Cd).—This mapping unit—widely distributed throughout the Coastal Plain section of the county—consists of a complex geographical association of Cuthbert clay loam, eroded hilly phase, and Savannah fine sandy loam, eroded hilly phase. Although the texture of the soils in the complex is called clay loam, the Savannah soils have a fine sandy loam surface soil in most places. An estimated 70 percent of the total area is Cuthbert soils, and 30 percent, Savannah soils. The soils have developed from unconsolidated sandy clay.

Profile descriptions:

Cuthbert clay loam, eroded hilly phase:

- 0 to 6 inches, grayish-yellow friable clay loam; 0 to 8 inches thick.
- 6 to 22 inches, strongly plastic reddish-yellow clay mottled with red, yellow, and gray; 10 to 20 inches thick.
- 22 inches +, reddish-yellow sandy clay that has thin layers of gray clay.

Savannah fine sandy loam, eroded hilly phase:

- 0 to 6 inches, grayish-yellow fine sandy loam; 0 to 8 inches thick.
- 6 to 22 inches, yellowish-brown or brownish-yellow friable clay loam; 16 to 22 inches thick.
- 22 to 40 inches, compact clay loam highly mottled with red, yellow, brown, and gray; 12 to 18 inches thick.
- 40 inches +, reddish-yellow sandy clay streaked and splotted with yellow.

Areas of this complex have lost variable quantities of surface soil through erosion. Some small areas have lost all the surface soil and have numerous and conspicuous exposures of subsoil. The Savannah soils are generally less eroded than the Cuthbert, chiefly because they have milder relief. The mixing of the upper part of the subsoil with remnants of the original surface soil has resulted in a heavier textured surface layer on most of the Cuthbert soil.

These soils are very strongly acid and low in plant nutrients and water-holding capacity. They are very low in organic matter. External drainage is rapid, but internal drainage is slow. Sandstone fragments have accumulated on the surface and are common throughout the soil profile in most places.

Present use and management.—All areas of Cuthbert-Savannah clay loams, eroded hilly phases, have been cleared and used for crops, but they are now largely abandoned or in unimproved pasture. A small part of the complex is used for crops, but yields are very low.

Use and management requirements.—This complex is very poorly suited to crops or pasture, chiefly because of low fertility, low water-holding capacity, steepness, and poor tilth. It is probably best used for forests, though poorly suited to that use. Reforestation will be difficult; special measures will be required to establish a stand of trees.

Cuthbert-Savannah clay loams, severely eroded hilly phases (12-30% slopes) (C_E).—This complex distributed throughout the Coastal Plain section is made up of Cuthbert clay loam, severely eroded hilly phase, and Savannah clay loam, severely eroded hilly phase. The Cuthbert soil forms about 70 percent of the complex; the Savannah, 30 percent. Both have developed from unconsolidated sandy clay.

Profile descriptions:

Cuthbert clay loam, severely eroded hilly phase:

- 0 to 4 inches, grayish-yellow or reddish-yellow moderately plastic clay loam; 0 to 6 inches thick.
- 4 to 20 inches, strongly plastic reddish-yellow clay mottled with red, yellow, and gray; 10 to 20 inches thick.
- 20 inches +, reddish-yellow sandy clay having thin layers of gray clay.

Savannah clay loam, severely eroded hilly phase:

- 0 to 4 inches, grayish-yellow or brownish-yellow friable clay loam; 0 to 6 inches thick.
- 4 to 20 inches, yellowish-brown or brownish-yellow friable clay loam; 16 to 22 inches thick.
- 20 to 38 inches, compact clay loam highly mottled with red, yellow, brown, and gray; 12 to 18 inches thick.
- 38 inches +, reddish-yellow sandy clay streaked and splotched with yellow.

Erosion has removed most of the original surface layers and a part of the subsoil in some places. Shallow gullies are common. The erosion has been less severe on the Savannah soils, but gullies are very conspicuous owing to exposure of the compact hardpan layer. The present surface layers are heavier textured, owing to the mixing of the remnants of the original surface layer with the upper part of the subsoil.

External drainage on these soils is very rapid, but internal drainage is slow. They are very low in organic matter and plant nutrients and very strongly acid. Their water-holding capacity is low. In some places a considerable number of sandstone fragments have accumulated on the surface and in the plow layer.

Present use and management.—All of Cuthbert-Savannah clay loams, severely eroded hilly phases, is cleared and practically all areas are wasteland, although a small part is used for unimproved pasture. Crops on this complex generally are a complete failure, and pasture yields are extremely low.

Use and management requirements.—The severely eroded hilly phases of Cuthbert-Savannah clay loams are very poorly suited to crops or pasture chiefly because of their low fertility, steepness, poor tilth, and low water-holding capacity. They are best used for forest. They will be difficult to reforest, and special preparation will probably be required.

Dexter silt loam, rolling phase (5-12% slopes) (D_D).—Small areas of this well-drained soil of the terraces occur along larger streams in the western part of the county. Most of them are along the Beech River and Turkey and Cub Creeks. The soil is closely associated with Freeland soils of the terrace lands and Shannon and Hyman soils of the bottom lands. It has developed under deciduous forest vegetation from parent material consisting of old mixed alluvium that washed from upland soils derived from loess or Coastal

Plain sand and clay. In many places the upper profile is derived from a thin layer of loess.

Profile description :

- 0 to 10 inches, grayish-brown mellow silt loam ; 8 to 12 inches thick.
- 10 to 36 inches, reddish-brown or brownish-red friable silty clay loam ; 20 to 30 inches thick.
- 36 inches +, brownish-red friable clay loam splotched with yellow and gray ; depth in most places, 5 to 15 feet.

The soil is strongly acid and relatively high in organic matter and plant nutrients. Its water-holding capacity is high in comparison with that of the soils of the uplands with which it is associated. External and internal drainage are moderate. The soil is readily permeable to air, roots, and water. The surface layer is usually free of gravel, but the lower layers contain some gravel and may be sandy in places.

Present use and management.—Practically all of the rolling phase of Dexter silt loam is wooded, chiefly with red and white oaks, hickory, beech, elm, and cherry. Most of the area has been cut over recently and has very little marketable timber. Trees grow rapidly, however, and the quality of the timber is good.

Use and management requirements.—The phase is well suited to crops and pasture but is not cleared because the areas are small, hard to get at, and associated with soils unsuited to crops. The soil is naturally productive of practically all crops grown in the county, and it is very responsive to improved management. A short rotation that includes a legume crop, preferably a deep-rooted one, is suitable. The legume crop needs lime. Applications of phosphate will increase the yields of most crops; nitrogen probably will be needed for high yields of all except legume crops and the crops immediately following. Special practices for controlling runoff and erosion should not be needed. The slopes are short and not easily terraced, but a diversion terrace or ditch at the top of the slope should be helpful in many places. Under good management expectable acre yields are 50 bushels of corn, 480 pounds of cotton, and 1.8 tons of lespezea hay.

Dexter silt loam, eroded rolling phase (5-12% slopes) (D_A).—This well-drained moderately eroded soil occurs on terraces along all larger streams in the western part of the county. It is closely associated with Freeland, Briensburg, Hyman, and Beechy soils.

The soil has developed from old mixed alluvium washed from uplands soils underlain by loess or Coastal Plain sand and clay. In many places a shallow layer of loess covers the alluvium and contributes to the parent material. Development took place under a deciduous forest consisting chiefly of red and white oaks, hickory, beech, elm, and cherry. The individual areas vary from about 2 to 10 acres; the average size is about 5 acres.

Profile description :

- 0 to 6 inches, grayish-brown or light-brown friable silt loam ; 0 to 10 inches thick.
- 6 to 32 inches, reddish-brown or brownish-red friable silty clay loam ; 20 to 30 inches thick.
- 32 inches +, brownish-red friable clay loam splotched with yellow and gray ; in most places increasingly sandy with depth ; 5 to 15 feet deep.

A substantial part of the original surface layer has been eroded away, but enough remains to form the plow layer over most areas. The subsoil is exposed in a few places.

The soil is moderately high in organic matter, plant nutrients, and water-holding capacity. It is readily permeable to air, roots, and water. Internal and external drainage are moderate. The surface layer is relatively free of gravel, but the lower layers contain a considerable quantity in some places.

Present use and management.—All of Dexter silt loam, eroded rolling phase, is cleared and used for crops or pasture. An estimated 30 percent is used for corn, 30 percent for cotton, and 15 percent for hay and pasture crops. About 25 percent is in miscellaneous crops or lies idle. A variety of crops are grown, but not in any systematic rotation designed to improve the soil. Cotton is generally fertilized with 200 pounds of 20-percent superphosphate or (1) a fertilizer mixture such as 3-9-6 or 4-12-4 or (2) a mixed low-analysis fertilizer. Fertilization of other crops is not commonly practiced. Some farmers recently started using lime and phosphate on the legume crop. About 2 tons of lime and 200 pounds of triple superphosphate is the usual application. Under common management corn yields about 22 bushels; cotton, 280 pounds; and lespedeza hay, 1 ton an acre.

Use and management requirements.—This is a desirable soil for cultivation. It is productive, responsive to good management, and well suited to a wide variety of crops.

High yields can be maintained under a moderately short rotation that contains a legume. Lime and phosphate are needed for the legume crop. Phosphate fertilizer will increase the yields of most crops. Nitrogen fertilizers are needed for all except the legume crop and the crop immediately following. Growing of winter cover crops is desirable; they supply nitrogen, offer protection from erosion, and serve as a green-manure when plowed under. Terracing and other special measures may be necessary and desirable for controlling runoff and erosion, but the need for these will depend upon other management practices. Under good management expectable acre yields are 45 bushels of corn, 420 pounds of cotton, and 1.6 tons of lespedeza hay.

Dexter silt loam, eroded undulating phase (2-5% slopes) (DB).—This well-drained soil is associated with other Dexter soils and with Freeland, Hatchie, and Almo soils on terraces along major streams in the western part of the county. The individual areas vary from about 2 to 10 acres, but the average size is less than 5 acres. The soil developed from old alluvium that washed from upland soils derived from loess or Coastal Plain sand and clay.

Profile description:

- 0 to 8 inches, grayish-brown or light-brown mellow silt loam; 0 to 10 inches thick.
- 8 to 40 inches, reddish-brown or brownish-red friable silty clay loam; 20 to 35 inches thick.
- 40 inches +, yellowish-brown to brownish-red friable silty clay loam or clay loam; highly variable in texture and color; 5 to 15 feet deep.

Erosion has removed a substantial part of the original surface layer; consequently, the present surface layer varies considerably in thickness. Subsoil is mixed with the original surface soil in some places

but is exposed in only a very few. Over most of the phase plowing is done entirely within the original surface soil.

The plant-nutrient content and water-holding capacity are relatively high in comparison to those of other well-developed soils in the county. There is a moderate quantity of organic matter, though the layer containing the most organic matter has been removed by erosion or lost through cropping. External drainage is moderate to slow, and internal drainage is moderate. The soil is readily permeable to air, roots, and water.

Variations in this phase are caused chiefly by differences in degree of erosion. Some small areas are uneroded or only slightly eroded; others are severely eroded. These variations occur in very small areas and their use and management is similar to that of this eroded undulating soil.

Present use and management.—Practically all of Dexter silt loam, eroded undulating phase, is cleared and has been used for crops and pasture. An estimated 30 percent is used for corn, 30 percent for cotton, and the rest for miscellaneous crops or pasture. Little of this soil is ever idle. A wide variety of crops are grown, but they are not rotated systematically. Fertilization is not a general practice for all crops. Cotton is generally fertilized with about 200 pounds an acre of 20-percent superphosphate or with a 4-10-4 mixture. Recently, many farmers have started using lime and phosphate on the legume hay crop. Under average management expectable acre yields are 25 bushels of corn, 320 pounds of cotton, and 1.2 tons of lespedeza hay an acre.

Use and management requirements.—The eroded undulating phase of Dexter silt loam is excellent for crops or pasture. It has a mild relief, good tilth, high water-holding capacity, and relatively good fertility. Also, it responds to good management and is suited to a wide variety of crops. Comparatively high productivity can be maintained under a short crop rotation, which should include a legume, preferably a deep-rooted one. All crops need applications of phosphate; all crops except legumes and the crop immediately following need nitrogen. Lime is needed to establish and maintain the legume crop. A winter cover crop, preferably a legume or a legume-and-small-grain mixture, should follow all clean-cultivated crops. Terracing and other special practices for controlling runoff and erosion should not be necessary.

Dexter silt loam, hilly phase (12-30% slopes) (Dc).—Usually this well-drained soil occurs on short slopes breaking down from a high terrace to the flood plain of a stream. It is associated chiefly with other Dexter soils and soils of the Freeland, Hymon, and Beechy series. It differs from the rolling phase of Dexter silt loam mainly in having steeper slopes. The parent material is old mixed alluvium washed from upland soils that were derived from loess or Coastal Plain sand and clay. The soil developed under a deciduous forest consisting chiefly of red and white oaks, hickory, beech, elm, and maple.

Profile description :

0 to 8 inches, grayish-brown or light-brown mellow silt loam ; 6 to 12 inches thick.

8 to 30 inches, reddish-brown or brownish-red friable silty clay loam; 15 to 30 inches thick.

30 inches +, brownish-red friable clay loam; variable in thickness and texture; in general, sandier with increasing depth.

The soil is strongly acid and moderately high in plant nutrients, organic matter, and water-holding capacity. It is readily permeable to air, roots, and water. External drainage is rapid, but internal drainage is moderate. The surface layer is free of gravel, but in many places the lower layers have considerable gravel.

Variations in this phase are caused chiefly by differences in erosion. About half of the total acreage has lost a substantial part of the original surface soil. The present surface layer consists of the upper part of the subsoil mixed with remnants of the original surface soil. The present surface soil varies in thickness, and the subsoil is exposed in places.

Present use and management.—More than half of the hilly phase of Dexter silt loam is in forest. The cleared land is used for crops and pasture; only a small part is idle. Crops are not systematically rotated, and fertilization is inadequate. Crop yields are moderately good, but erosion is very difficult to control on tilled areas.

Use and management requirements.—The phase is poorly suited to tilled crops, chiefly because it is highly susceptible to erosion. It is moderately productive of most hay and pasture, and erosion can be controlled if it is used for such close-growing crops. The pasture or hay mixture should include a deep-rooted legume. Lime and phosphate will be needed to establish a good pasture or meadow, and phosphate must be applied at frequent intervals to maintain high productivity. Moderate applications of lime at 5-year intervals should be adequate. Provided adequate fertilization is practiced and a winter cover crop follows the row crop, the soil is suited to a long rotation that includes a row crop once every 5 or 6 years.

Dexter silty clay loam, severely eroded hilly phase (12–30% slopes) (D_E).—This severely eroded well-drained soil occupies relatively high terraces along larger streams in the Coastal Plain section. The small individual areas are closely associated with other Dexter soils and soils of the Freeland, Hymon, and Beechy series. The parent material is old mixed alluvium washed from upland soils that were derived from loess or Coastal Plain sand and clay.

Profile description:

0 to 4 inches, light-brown or reddish-brown friable silty clay loam; 0 to 6 inches thick.

4 to 26 inches, reddish-brown or brownish-red friable silty clay loam; 15 to 30 inches thick.

26 inches +, brownish-red friable clay loam; variable thickness and texture; in general, more sandy with increasing depth.

Most of the original surface layer has been lost through erosion. The present surface layer is the upper part of the subsoil mixed with remnants of the original surface soil. The texture of the present surface layer varies from silt loam to silty clay loam, largely according to the amount of subsoil material in the mixture. Shallow gullies are common.

The soil is strongly acid and low in organic-matter content and water-holding capacity. It is also moderately low in plant nutrients.

External drainage is rapid, and internal drainage is moderate. The soil is permeable to air, roots, and water.

Present use and management.—All of Dexter silty clay loam, severely eroded hilly phase, is cleared and has been used at some time for crops. Now only a small part is used for crops and pasture; the rest lies idle or abandoned. Crop and pasture yields are very low.

Use and management requirements.—In its present condition this soil is probably best used for forest. It is fairly well suited to pasture, however, and evidence indicates that good pasture can be established and maintained. To start pastures, applications of lime and phosphate will be needed; engineering measures, as diversion ditches and check dams, may be necessary; and drought-resistant pasture plants should be selected. Once established, the pastures should improve with age if adequate lime, phosphate, and nitrogen are applied and management is otherwise good.

Dexter silty clay loam, severely eroded rolling phase (5–12% slopes) (Df).—On terraces along larger streams in the western part of the county small areas of this well-drained severely eroded soil occur in association with other Dexter soils and those of the Freeland, Hymon, Beechy, and Briensburg series. The soil has developed from old mixed alluvium, which washed from upland soils derived from loess and Coastal Plain sand and clay.

Profile description:

- 0 to 4 inches, light-brown or reddish-brown friable silty clay loam; 0 to 6 inches thick.
- 4 to 30 inches, reddish-brown or brownish-red friable silty clay loam; 20 to 30 inches thick.
- 30 inches +, brownish-red friable clay loam, splotted with yellow and gray; in most places more sandy with increasing depth; 5 to 15 feet deep.

Most of the original surface soil and, in many places, part of the subsoil have been lost through accelerated erosion. The present surface layer is the upper part of the subsoil, with a small part of the original surface layers admixed. Shallow gullies penetrating the subsoil are common. Many intergully areas still have a considerable part of the original surface layer.

The organic-matter content is low compared to that of the uneroded phase. Also, this soil is moderate to low in plant nutrients and water-holding capacity. It is permeable to air, roots, and water. Internal drainage is moderate; external drainage, moderately rapid.

Present use and management.—All of Dexter silty clay loam, severely eroded rolling phase, is cleared and has been used for crops or pasture, but most of it is now lying idle. Use and management were not adjusted to the physical limitations of the soil. In most places the soil was kept in row crops continuously, and without winter cover crops or mechanical means of erosion control. Crops were not rotated, nor was fertilizer commonly applied. The result was severe erosion. Now the yield of crops and pasture is very low.

Use and management requirements.—The phase is better suited to pasture or close-growing crops than to those requiring tillage. Applications of lime and phosphate are necessary to establish and maintain pasture or hay crops. The hay crop or pasture mixture should include a legume to supply nitrogen, but while the stand is becoming

established, nitrogen fertilizer may be necessary. Lespedeza is easy to establish, but deep-rooted legumes and sod-forming grasses are more effective in controlling erosion and increasing productivity. After several years in well-managed pasture or hay crops, the soil should remain productive if it is kept in a long rotation that includes a deep-rooted legume. Terraces may be an effective aid in checking erosion, but the short slopes are not well suited to them. A diversion ditch or terrace at the top of the slope, however, will be helpful in many places.

Dickson silt loam, undulating phase (2-5% slopes) (DL).—This moderately well drained upland soil occurs in close association with the Bodine soils on the broad ridge crests in the Limestone Hills section. It is readily identified by a 24- to 42-inch chert-free layer over very cherty material. The parent material consists of wind-blown silt that contains in most places an admixture of cherty limestone residuum. Soil development took place under deciduous forest.

Profile description:

- 0 to 8 inches, yellowish-gray mellow silt loam; 6 to 10 inches thick.
- 8 to 24 inches, yellowish-brown to brownish-yellow friable silty clay loam; 12 to 20 inches thick.
- 24 to 40 inches (siltpan) compact silt loam to silty clay loam mottled with gray, yellow, and brown; 12 to 20 inches thick.
- 40 inches +, cherty limestone residuum; 10 feet or more thick.

The surface soil and subsoil are free of chert, but in some places the siltpan has a few chert fragments. The material below the siltpan is very cherty. The upper part of the profile is permeable to air, roots, and water, but the siltpan is very slightly permeable.

External drainage is moderate, and internal drainage is moderately slow. The soil has a low water-holding capacity. It is low in organic matter and plant nutrients and strongly to very strongly acid.

Present use and management.—Practically all of Dickson silt loam, undulating phase, is wooded, chiefly with post, blackjack, red, and white oaks. The timber grows very slowly, and cutting of only the better trees has left many useless ones in the stand. Burning and grazing also lower timber production.

Use and management requirements.—The undulating phase of Dickson silt loam is physically suitable for a wide variety of crops, but chiefly because of its low fertility and water-holding capacity, it is only moderately productive of most crops. It is suited to a fairly short rotation that does not include a row crop more often than once in 4 years. The rotation should include a legume, and a cover crop should follow the intertilled crop. Applications of lime, phosphate, and possibly potash are necessary for the legume crop. Applications of nitrogen will be needed for all crops except the legumes and the crop immediately following.

Complete fertilizers are needed for cotton and for all grain crops. Planting a legume cover crop such as vetch or crimson clover after the intertilled crop will protect the soil from erosion and also add nitrogen and organic matter to the soil. Owing to the low water-holding capacity, the corn crop is frequently injured by drought. Small grains give proportionally higher yields than corn, chiefly because they mature during the season of higher rainfall. Under good management expected acre yields are 43 bushels of corn, 440 pounds of cotton, and 1.5 tons of lespedeza hay.

Dickson silt loam, eroded undulating phase (2-5% slopes) (DH).—This moderately well-drained eroded soil of the uplands is widely distributed on ridge crests throughout the Limestone Hills section. It developed from a thin layer of wind-blown silt underlain at 24 to 42 inches by very cherty material. The forest vegetation consisted chiefly of oaks.

Profile description:

- 0 to 6 inches, grayish-yellow mellow silt loam; 0 to 8 inches thick.
- 6 to 22 inches, yellowish-brown to brownish-yellow friable silty clay loam; 12 to 20 inches thick.
- 22 to 38 inches (siltpan) compact silt loam to silty clay loam mottled with gray, yellow, and brown; 12 to 20 inches thick.
- 38 inches +, cherty limestone residuum; 10 feet or more thick.

The surface soil and subsoil are free of chert, but in places the siltpan contains chert. The material below the siltpan is very cherty. A considerable part of the original surface layer has been eroded away. The plow layer still consists of the original surface layer, but some subsoil is mixed with it in places. A few small severely eroded spots are conspicuous because the subsoil is exposed. The upper part of the profile is permeable, but the siltpan is only slightly permeable.

External drainage is moderate, but internal drainage is moderately slow. The soil has a low water-holding capacity. It is low in organic matter and plant nutrients and strongly to very strongly acid.

About a third of the total acreage is only slightly eroded, and therefore somewhat less exacting in management requirements and slightly more productive. Also, there are a few small severely eroded areas where subsoil is mixed with the original surface soil to form a silty clay loam plow layer. Crop yields are definitely lower and management requirements much more exacting on the severely eroded areas than on the soil described.

Present use and management.—All of this soil is cleared, and a large part is cropped. An estimated 30 percent is used for corn, 10 percent for cotton, 20 percent for hay, chiefly lespedeza, and 10 percent for miscellaneous crops. About 30 percent lies idle. The crops are not grown in systematic rotations, and adequate fertilization is not practiced. With ordinary management 18 bushels of corn, 240 pounds of cotton, and 0.8 ton of lespedeza hay an acre are obtained.

Use and management requirements.—This phase is physically well suited to crops. Its management is concerned chiefly with increasing fertility and checking loss of soil material through erosion. An adequately fertilized rotation including grasses and legumes should increase crop yields and check the erosion. An intertilled crop should not be grown more often than once every 4 years. All crops need phosphate, and possibly potash. Cotton and legume crops are especially responsive to potash. Proportionally, small grains yield better than corn. Winter legume crops, such as vetch and crimson clover, should follow the intertilled crop or be sown with small grain. They add some nitrogen and organic matter to the soil. Under good management expectable acre yields are 40 bushels of corn, 400 pounds of cotton, and 1.4 tons of lespedeza hay. Liming is necessary to establish legumes; applications of nitrogen will be needed for all crops except the legumes and the crop immediately following.

Dickson silt loam, rolling phase (5–12% slopes) (Dκ).—This is a moderately well drained siltpan soil of the uplands. It occurs throughout the Limestone Hills section, usually in long narrow areas on ridge crests. Some member of the Bodine series is on the ridge slopes below this soil in most places. The soil has developed from a thin layer of loess underlain at 24 to 42 inches by cherty limestone residuum. It differs from Dickson silt loam, undulating phase, chiefly in having a stronger slope, but its chert-free layer is somewhat thinner on the average.

Profile description :

0 to 8 inches, yellowish-gray mellow silt loam ; 6 to 10 inches thick.

8 to 24 inches, yellowish-brown to brownish-yellow friable silty clay loam ; 12 to 20 inches thick.

24 to 38 inches (siltpan) compact silt loam to silty clay loam mottled with gray, yellow, and brown ; 10 to 16 inches thick.

38 inches +, cherty limestone residuum ; 10 feet or more thick.

The surface soil and subsoil are free of chert, but numerous chert fragments are in the siltpan in many places. The material below the siltpan is very cherty.

External drainage is moderate, but internal drainage is moderately slow. The upper part of the profile is permeable to air, roots, and water, but the siltpan is only slightly permeable. The soil is low in plant nutrients and organic matter and is strongly to very strongly acid. It has a low water-holding capacity.

Present use and management.—Practically all of the rolling phase of Dickson silt loam is in forest consisting chiefly of post, blackjack, red, and white oaks. Timber grows slowly, and the present stand is of poor quality. All areas have been cut over one or more times ; most of them have been injured by burning and grazing.

Use and management requirements.—This soil is physically well suited to a wide variety of crops but is inferior to the undulating phase of Dickson silt loam because of the steeper slopes. It is very susceptible to erosion and naturally low in productivity.

The crop rotation should consist chiefly of close-growing crops, including legumes. An intertilled crop should not be grown more often than once in 5 or 6 years. Applications of lime and phosphate will be necessary to establish and maintain the legume crop. Phosphate is needed for all crops, and nitrogen for all except the legume. Potash will probably be needed for all except the corn crop. Special measures for controlling runoff may be desirable. The row crop should always be tilled on the contour. Terraces may be practical on the long smooth slopes, but have proved successful only when used as part of a good management program. Under good management expectable acre yields are 38 bushels of corn, 400 pounds of cotton, and 1.4 tons of lespedeza hay.

Dickson silt loam, eroded rolling phase (5–12% slopes) (Dg).—This moderately well drained siltpan soil of the uplands occurs chiefly on ridge crests in the Limestone Hills section. It is closely associated with the Bodine soils. It developed under deciduous forest from a thin layer of loess underlain at 24 to 42 inches by cherty limestone residuum. It differs from Dickson silt loam, rolling phase, in being eroded.

Profile description :

- 0 to 6 inches, grayish-yellow or brownish-yellow mellow silt loam; 0 to 8 inches thick.
- 6 to 22 inches, yellowish-brown to brownish-yellow friable silt loam; 12 to 20 inches thick.
- 22 to 36 inches (siltpan) compact silt loam to silty clay loam mottled gray, yellow, and brown; 10 to 16 inches thick.
- 36 inches +, cherty limestone residuum; 10 feet or more thick.

The surface soil and subsoil are free of chert, but the siltpan contains numerous fragments in many places. The material below the siltpan is very cherty. The upper part of the profile is permeable, but the siltpan is only slightly permeable.

External drainage is moderate; internal drainage, moderately slow. The soil is low in plant nutrients, organic matter, and water-holding capacity. It is strongly to very strongly acid.

Erosion has removed a considerable part of the original surface layer. The present surface layer consists of subsoil mixed with the remnants of the original surface soil. Not enough subsoil has been incorporated in the surface layer to materially affect the texture, but the surface layer is heavier in places. Small spots of exposed subsoil are common and conspicuous.

Present use and management.—All of Dickson silt loam, eroded rolling phase, is cleared and used for crops and pasture. About 20 percent is used for corn, 10 percent for cotton, 20 percent for hay, and 10 percent for miscellaneous crops. Approximately 40 percent lies idle. Crops are not rotated, nor is fertilizer generally used. Some fertilizer is used on cotton; recently some lime and phosphate have been applied to the hay crop. Expectable acre yields under common management are about 16 bushels of corn, 220 pounds of cotton, and 0.7 ton of lespedeza hay.

Use and management requirements.—This phase is physically suited to a wide variety of crops but naturally low in productivity. Continuous cropping and erosion have reduced yields still further. Management should be concerned chiefly with controlling erosion and increasing fertility. A long rotation consisting chiefly of close-growing crops is desirable.

The soil is low in lime, phosphate, nitrogen, and potash. These fertilizers will have to be added for most crops. A legume crop in the rotation will add nitrogen and organic matter. A legume winter cover crop should follow the intertilled crop. The row crops should be grown on the contour, and terraces will aid in controlling erosion if properly maintained. Under good management corn yields about 35 bushels; cotton, 380 pounds; and lespedeza hay, 1.2 tons an acre.

Dickson silty clay loam, severely eroded rolling phase (5-12% slopes) (Dm).—This is a severely eroded siltpan soil underlain by cherty material. It occurs in very small areas widely distributed throughout the Limestone Hills section and is associated chiefly with other Dickson soils and those of the Bodine series. The parent material is a thin layer of wind-blown silt with probably a small admixture of cherty limestone residuum. The soil is moderately well drained.

Profile description :

- 0 to 4 inches, grayish-yellow or brownish-yellow friable silty clay loam ;
0 to 6 inches thick.
- 4 to 20 inches, yellowish-brown to brownish-yellow friable silty clay loam ;
12 to 20 inches thick.
- 20 to 36 inches (siltpan) compact silt loam to silty clay loam mottled with
gray, yellow, and brown ; 10 to 16 inches thick.
- 36 inches +, cherty limestone residuum ; 10 feet or more thick.

The surface soil and subsoil are free of chert; the siltpan layer is cherty in some places. Below the siltpan the material is very cherty.

Most of the original surface soil has been removed by accelerated erosion, and shallow gullies are common. The plow layer consists largely of the upper part of the subsoil, but it includes remnants of the original surface layer. The removal of material has been very uneven; all of the original surface and part of the subsoil have been removed in some places, but in others in the same area as much as 6 inches of original surface soil may remain. This soil is strongly to very strongly acid. It is very low in organic matter, plant nutrients, and water-holding capacity.

Present use and management.—All of Dickson silty clay loam, severely eroded rolling phase, is cleared and has been cropped, but most of it is now wasteland or lies idle. Crops and pasture gave extremely low yields. On the abandoned areas erosion is stabilized very slowly under natural conditions.

Use and management requirements.—Dickson silty clay loam, severely eroded rolling phase, has been severely injured by erosion; it has very low productivity for crops and pasture in its present condition. Probably it is best used and managed as pasture, but pastures are not easy to establish or maintain. Application of lime, phosphate, and probably potash will be necessary. Engineering devices, as terraces, diversion ditches, and check dams in the gullies, will likely be necessary to control runoff until vegetation is established. Even under the best of management, pasture yields will be low during the period of rehabilitation.

If it is necessary to use this soil for crops, the rotation should be made up mainly of close-growing crops and should include grasses and legumes. Liberal applications of lime and fertilizers will be needed for best results. Cultivation should be on the contour; strip cropping may be desirable on the long slopes. Terraces will probably be needed to aid in controlling runoff.

Dulac silt loam, undulating phase (2-5% slopes) (Ds).—Ridge crests and slopes in the Loess Plain section and broad ridge crests in the Coastal Plain section are occupied by this soil. The largest and most extensive areas are near Scotts Hill, Decaturville, and Parsons and in the extreme north-central part of the county. The soil is associated with Briensburg, Hymon, Beechy, Tippah, Savannah, Cuthbert, and Safford soils.

This moderately well drained stone-free soil has siltpan at a depth of about 2 feet. The parent material consists of a thin layer of loess underlain by slowly permeable Coastal Plain material. The Coastal Plain material is predominantly a uniform sandy clay, but in some places it consists of stratified layers of sand and clay, or of

sand that has a layer of ferruginous sandstone at the contact between the silt and sand (pl. 4, A). The soil developed under deciduous forest.

Profile description :

- 0 to 8 inches, yellowish-gray mellow silt loam; 6 to 10 inches thick.
- 8 to 24 inches, yellowish-brown to brownish-yellow friable silty clay loam; 12 to 20 inches thick.
- 24 to 42 inches (siltpan) compact silt loam to silty clay loam mottled with gray, yellow, and brown; 12 to 20 inches thick.
- 42 inches +, slowly permeable sandy clay.

The soil is low in organic matter and plant nutrients and strongly to very strongly acid. The surface soil and subsoil are permeable to air, roots, and water, but the siltpan is only slightly permeable. External drainage is moderate, but internal drainage is moderate to slow. The soil is low in water-holding capacity.

Included in mapping are better drained areas having a less well developed siltpan; some small imperfectly drained areas; and many areas in which the silt layer is very thin and the siltpan is missing. The areas with better drainage and less siltpan development cover about half the acreage occupied by inclusions. All the included areas differ in use and management requirements, but they are too small to be mapped separately.

Present use and management.—Practically all of Dulac silt loam, undulating phase, is in forest consisting chiefly of oaks. Timber grows slowly, and the present stand is of poor quality. Some of this soil is on ridge crests and isolated by extensive areas of soils very poorly suited to crops, but most of it is in small regularly shaped areas associated with soils suited to crops. The soil has not been cleared, chiefly because it has not been needed on the particular farms where it occurs.

Use and management requirements.—This phase is fairly well suited to most crops commonly grown in the county. It has good tilth, mild relief, and a stone-free profile, but it is low in organic matter, lime, phosphorus, nitrogen, and potash. Also, it has an extremely well developed siltpan that interferes with movement of water through the soil and restricts root penetration. Chiefly because of low fertility and restricted drainage, the soil has only fair productivity and somewhat restricted use suitability. It readily responds to good management, but the effects of efforts made to improve it are not lasting. Cultivated areas are susceptible to erosion and can be severely damaged by erosion. If the land is to be cleared, management should be concerned mainly with addition of needed fertilizers and prevention of erosion.

Dulac silt loam, slightly eroded undulating phase (2-5% slopes) (Dr).—Areas of this moderately well-drained upland soil are fairly large. They occur chiefly in the Loess Plain section, where they are associated with other Dulac soils and with Briensburg and Beechy soils. The soil has developed from a thin layer of loess underlain by slowly permeable Coastal Plain materials. Development took place under a deciduous forest consisting chiefly of oaks. Individual areas range from 2 to 15 acres in size but average about 10 acres.

Profile description :

- 0 to 8 inches, grayish-yellow or yellowish-gray mellow silt loam; 4 to 10 inches thick.
- 8 to 24 inches, yellowish-brown or brownish-yellow silty clay loam; 12 to 20 inches thick.
- 24 to 42 inches (siltpan) compact silt loam to silty clay loam mottled with gray, yellow, and brown; 12 to 20 inches thick.
- 42 inches +, slowly permeable sandy clay highly mottled with red, yellow, and gray.

A small part of the surface soil has been eroded away but enough remains to form the plow layer in most places. The thin layer of higher organic matter content present in wooded areas has been lost.

The soil is low in organic matter, plant nutrients, and water-holding capacity and strongly to very strongly acid. The surface soil and subsoil are permeable to air, roots, and water, but the siltpan is only slightly permeable. External drainage is moderate; internal drainage, moderately slow.

Included is a considerable acreage having somewhat better drainage, a more permeable siltpan, and more permeable material beneath the siltpan. This variation does not greatly differ in use and management requirements.

Present use and management.—All of Dulac silt loam, slightly eroded undulating phase, is cleared, and most of it is now used for crops or pasture. About 40 percent is used for corn, 30 percent for cotton, and 20 percent for hay and pasture. Approximately 10 percent is used for miscellaneous crops or left idle.

Crops are not rotated, nor are they generally fertilized. The cotton crop is usually inadequately fertilized. Fertilization for other crops is not commonly practiced. Average acre yields under ordinary management are low: corn, 20 bushels; cotton, 260 pounds; and lespedeza hay, 0.9 ton.

Use and management.—This soil is physically well suited to most crops grown in the county but low in natural fertility. Crop yields can be increased considerably by improved management, which should include use of a crop rotation that contains legumes and grasses and proper and adequate use of fertilizers. Most crops will need phosphate, nitrogen, and potash; the legume will require lime, phosphate, and potash. Most of the crops, except possibly corn, will give a profitable response to potash. Potash is especially needed by the cotton crop. Nitrogen should not be needed for the legume crop or the crop immediately following.

Legume winter cover crops should follow intertilled crops. They protect the soil from erosion and add valuable nitrogen and organic matter. Special practices for erosion control should not be necessary if other management practices are good. Under good management expectable acre yields are 43 bushels of corn, 440 pounds of cotton, and 1.5 tons of lespedeza hay.

Dulac silt loam, eroded undulating phase (2-5% slopes) (Do).—This moderately eroded siltpan soil of the uplands is widely distributed throughout the Loess Plain and Coastal Plain sections. It is associated mainly with Briensburg, Hymon, Beechy, Savannah, Cuthbert, and Safford soils. The parent material consists of a thin layer

of loess underlain by slowly permeable Coastal Plain materials. The soil has developed under a forest consisting chiefly of oaks. It is moderately well drained.

Profile description :

- 0 to 6 inches, grayish-yellow mellow silt loam ; 0 to 8 inches thick.
- 6 to 22 inches, yellowish-brown or brownish-yellow friable silty clay loam ; 12 to 20 inches thick.
- 22 to 40 inches (siltpan) compact silt loam to silty clay loam mottled with gray, yellow, and brown ; 12 to 20 inches thick.
- 40 inches +, slowly permeable sandy clay mottled with red, yellow, and gray.

The soil has lost a substantial part of the surface layer through erosion. The thickness of the original layer has been materially reduced, and the plow layer includes a part of the subsoil in many places. Small severely eroded spots are conspicuous. Except in very small areas, not enough subsoil has mixed with the original surface soil to change significantly the texture of the plow layer.

The soil is strongly to very strongly acid and low in plant nutrients and organic matter. Both the surface soil and subsoil are permeable to air, roots, and water; the siltpan, however, is only slightly permeable. External drainage is moderate; internal drainage is moderately slow. The soil has a low water-holding capacity.

Present use and management.—All of Dulac silt loam, eroded undulating phase, is cleared, and most of it is being used for crops or pasture. About 30 percent is used for corn, 20 percent for cotton, and 20 percent for lespedeza hay. Another 20 percent is unimproved pasture or idle land. Present management is not designed to maintain or increase crop yields. Crops are neither adequately fertilized nor systematically rotated. Expectable acre yields under ordinary management are 18 bushels of corn, 240 pounds of cotton, and 0.8 ton of lespedeza hay.

Use and management requirements.—Use and management of this soil are similar to those for the slightly eroded phase. This soil is slightly less productive, however, chiefly because more material has been eroded from it. Longer rotations with fewer row crops and more legumes and grasses will be required. Somewhat heavier fertilization will be needed if similar yields are to be obtained. Under good management average acre yields are: Corn, 40 bushels; cotton, 400 pounds; and lespedeza hay, 1.4 tons.

Dulac silt loam, rolling phase (5-12% slopes) (Dr).—Narrow rolling ridge crests or ridge slopes throughout the Loess Plain and the Coastal Plain sections are occupied by this moderately well drained siltpan soil of the uplands. It is associated chiefly with other Dulac soils and Briensburg, Cuthbert, and Safford soils. It differs from Dulac silt loam, undulating phase, chiefly in having stronger slopes. The parent material consists of a 24- to 42-inch layer of loess underlain by slowly permeable Coastal Plain material. The forest vegetation consists chiefly of oaks.

Profile description :

- 0 to 8 inches, yellowish-gray mellow silt loam ; 6 to 10 inches thick.
- 8 to 24 inches, yellowish-brown or brownish-yellow friable silty clay loam ; 12 to 20 inches thick.

24 to 40 inches (siltpan) compact silt loam to silty clay loam mottled with gray, yellow, and brown; 10 to 20 inches thick.

40 inches +, slowly permeable sandy clay mottled with red, yellow, and gray.

This soil is strongly to very strongly acid and low in organic matter and plant nutrients. The surface soil and subsoil layers are permeable to air, roots, and water, but the siltpan is only slightly permeable. External drainage is moderate; internal drainage is moderately slow. The water-holding capacity is low.

Included with this phase is a considerable acreage of soils somewhat better drained internally and having only a weakly developed siltpan. A few slightly eroded areas are also included, and as well, a few small areas formed from a very thin layer of silt over a heavy clay similar to the parent material of the Safford soils. The included soils do not have a developed siltpan, but they are similar to the soil described in use and management requirements.

Present use and management.—Practically all of the rolling phase of Dulac silt loam is in forest consisting chiefly of post, blackjack, red, and white oaks. The trees grow slowly, and the quality of the present stand is low. Burning and grazing of the woodlands have aided in reducing timber yields.

Use and management requirements.—This soil is suitable to most of the common crops, but chiefly because of stronger slopes, is less well suited than Dulac silt loam, undulating phase. It is highly susceptible to erosion and is easily damaged by erosion if cultivated. Maintaining or increasing productivity and prevention of erosion will require proper and adequate fertilization and a long rotation consisting chiefly of close-growing crops. Rotations must include legumes and grasses. The need for terraces or other engineering devices to control runoff will depend largely on the intensity of use. Average expectable yields under good management are 38 bushels of corn, 400 pounds of cotton, and 1.4 tons of lespedeza hay.

Dulac silt loam, eroded rolling phase (5–12% slopes) (D_N).—This is a moderately well-drained siltpan soil of the uplands, widely distributed throughout the Loess Plain and Coastal Plain sections. It is closely associated with Cuthbert, Safford, Tippah, and Briensburg soils and other members of its own series. It differs from Dulac silt loam, rolling phase, chiefly in being eroded. It has developed under deciduous forest from a thin layer of loess underlain by slowly permeable Coastal Plain materials.

Profile description :

0 to 6 inches, grayish-yellow to yellowish-gray mellow silt loam; 0 to 8 inches thick.

6 to 22 inches, yellowish-brown to brownish-yellow friable silty clay loam; 12 to 20 inches thick.

22 to 38 inches (siltpan) compact silt loam to silty clay loam mottled with gray, yellow, and brown; 10 to 20 inches thick.

38 inches +, slowly permeable sandy clay mottled with red, yellow, and gray.

A considerable part of the original surface soil has been removed by erosion. Within any area the quantity lost varies greatly from place to place. Enough of the original surface soil remains to constitute the plow layer over most of the area. Nevertheless, small severely eroded spots exposing the subsoil are common.

This soil is low in organic matter, plant nutrients, and water-holding capacity, and it is strongly to very strongly acid. The surface soil and subsoil layers are permeable to air, roots, and water, but the siltpan is only slightly permeable. External drainage is moderate; internal drainage is moderately slow.

About one-third of the total acreage is somewhat better drained and has a less well developed siltpan than the soil as described. Also, a few small areas that developed from a very thin loess mantle and that do not have a siltpan are included. The use and management requirements of these variations do not differ significantly from those of the rest of the soil.

Present use and management.—All of Dulac silt loam, eroded rolling phase, is cleared and used for crops or pasture. About 25 percent is used for corn, 20 percent for cotton, 20 percent for hay or pasture, and 10 percent for miscellaneous crops. Approximately 25 percent is wasteland or land left idle. Little fertilizer is used, except on the cotton crop. The commonly used applications—about 200 pounds of 20-percent superphosphate or (1) a fertilizer mixture of 3-9-6 or 4-12-4 or (2) a mixed low-analysis fertilizer—are not adequate for good yields. Crops commonly are not rotated for the purpose of maintaining or increasing productivity. Expectable acre yields under ordinary management are 16 bushels of corn, 220 pounds of cotton, and 0.7 ton of lespedeza hay.

Use and management requirements.—The eroded rolling phase of Dulac silt loam has physical properties suitable for production of most crops common to the area, but it produces only moderate yields. It is similar to Dulac silt loam, eroded undulating phase, in use and management requirements, but more susceptible to erosion. The rotation probably should be longer and include as many close-growing crops as feasible. Cultivation should be on the contour; long slopes should be strip-cropped along the contour. Terraces may help control erosion, but their use on siltpan soils is questionable. Unless used with other good management practices, terraces are ineffective. Under good management acre yields are: Corn, 35 bushels; cotton, 380 pounds; and lespedeza hay, 1.2 tons.

Dulac silty clay loam, severely eroded rolling phase (5-12% slopes) (Dt).—Areas of this severely eroded soil of the uplands are distributed throughout the Loess Plain and Coastal Plain sections. The soil is closely associated with Cuthbert, Safford, Tippah, Briensburg, Hyman, and Beechy soils and with other Dulac soils. It has developed from a thin silt mantle underlain by slowly permeable Coastal Plain materials.

Profile description:

- 0 to 4 inches, grayish-yellow or brownish-yellow friable silty clay loam; 0 to 6 inches thick.
- 4 to 20 inches, yellowish-brown to brownish-yellow friable silty clay loam; 12 to 20 inches thick.
- 20 to 36 inches (siltpan) compact silt loam to silty clay loam mottled with gray, yellow, and brown; 10 to 20 inches thick.
- 36 inches +, slowly permeable sandy clay mottled with red, yellow, and gray.

This soil has lost most of its original surface layer, and shallow gullies have penetrated the subsoil in many places. In most places

enough subsoil has been incorporated into the present surface layer to give it a heavier texture than the original surface soil had. Sheet erosion has been less severe than gulying in most places. Closely spaced shallow gullies through areas that still have much of the original surface soil are characteristic.

This soil is very low in organic matter, plant nutrients, and water-holding capacity. It is strongly to very strongly acid. The upper part of the profile is permeable to air, roots, and water, but the siltpan is only slightly permeable. External drainage is moderate to rapid, and internal drainage is moderately slow.

About one-third of the total acreage of this phase is somewhat better drained internally and has a more permeable siltpan. Also included is a very small acreage that does not have a siltpan; erosion has removed most of the thin silt mantle from this, and the underlying heavy glauconitic clays are exposed in many places. These variations do not differ greatly from the soil described in use and management requirements.

Present use and management.—All of Dulac silty clay loam, severely eroded rolling phase, is cleared and has been cropped, but most of it is now either lying idle or being used as unimproved pasture. A very small part is used for crops. Both crop and pasture yields are very low.

Use and management requirements.—This soil has been severely injured by erosion and now has very low productivity for both crops and pasture. Trees are very difficult to reestablish and grow very slowly. Possibly the soil is best used and managed for pasture. Heavy applications of lime, phosphate, and probably potash will be necessary to establish and maintain even fair pasture. Even with good management, the soil will not produce much pasture except during wet seasons. Until a sod can be established, terraces or diversion ditches will probably be necessary to aid in controlling runoff.

If it is necessary to cultivate this soil, the rotation should consist chiefly of close-growing crops, including legumes and grasses. These crops are difficult to establish, but there is evidence that sericea can be established if the soil is heavily treated with lime and phosphate. After a legume crop has been established, it should be left as long as it remains reasonably productive. Fertilization is essential for all crops. Cultivation should be on the contour, and contour strip cropping should be practiced on the long slopes.

Egam silty clay loam (0-3% slopes) (E_A).—On the nearly level flood plains of the Tennessee River this first bottom soil occurs in close association with Huntington, Lindside, Melvin, Bruno, and Wolftever soils. Its position is similar to that of the Huntington soils, but in most places it is farther back from the river. It is darker, heavier textured, and much less productive than Huntington soils. The forest consists chiefly of oaks, hickory, elm, beech, and sycamore. The parent material—mixed alluvium washed chiefly from upland soils underlain by limestone—was deposited mainly on high first bottoms or in slack water on the low first bottoms. The soil is young; differences in texture are caused chiefly by accidents of deposition.

Profile description:

0 to 12 inches, dark grayish-brown or almost black moderately plastic silty clay loam; 8 to 16 inches thick.

- 12 to 26 inches, grayish-brown to yellowish-brown compact silty clay loam;
10 to 20 inches thick.
26 inches +, grayish-brown moderately friable silty clay loam spotted
with light gray; 10 feet or more thick.

This soil apparently contains a moderate quantity of organic matter and is relatively high in plant nutrients. It is medium acid. External drainage is slow; internal drainage, moderately slow. The soil has a high water-holding capacity, but the quantity of moisture held available for crops is low.

Present use and management.—Practically all of Egam silty clay loam is cleared and cropped. Corn is most widely grown, but the proportion of the soil in corn is not so high as on the Huntington soils. An appreciable acreage is in lespedeza, cowpeas, soybeans, and oats. Possibly 15 or 20 percent is idle. Fertilization is not used, and crops are not systematically rotated. Yields are extremely variable; they depend largely on the quantity and distribution of rainfall. Average acre yields under ordinary management are 25 bushels of corn and 1.3 tons of lespedeza hay. At present 430 acres of this phase is covered by the Kentucky Reservoir.

Use and management requirements.—Egam silty clay loam is suitable for crops, but its value is somewhat limited by periodic overflows and extreme droughtiness. Management should include selection of drought-resistant crops, improved seedbed preparation, and better tillage practices. Corn is most frequently grown, though it is more susceptible to drought than many other crops grown less frequently. Cane crops grown for seed or fodder are much more drought resistant and yield more feed per acre. Lespedeza, soybeans, and cowpeas usually make yields and seldom fail completely. Small grains or other crops that mature before the dry part of summer and fall usually make high yields, but the overflow hazard discourages their use. Spring oats, rarely lost as a result of flooding, are grown for seed or hay on many farms.

The seedbed on this soil is often not well enough prepared, and tillage practices are frequently poorly timed and inadequate. The soil tends to puddle when plowed too wet, and it becomes hard and cloddy upon subsequent drying. If allowed to get too dry, it breaks up very cloddy. It can be tilled over a very narrow range of moisture content. Seed will germinate better on a well-prepared seedbed, and early growth of crops will be more rapid. Use of a rotation that includes a legume and the plowing under of green-manure crops should improve both tilth and productivity.

Although 60 or 70 bushels of corn are obtained in favorable seasons the average yield under good management is about 40 bushels an acre. Under similar management lespedeza hay should yield 1.5 tons; and soybean hay, 2 tons.

Emory silt loam (2-5% slopes) (E_B).—This young soil of the colluvial lands is on toe slopes, small gently sloping alluvial lands, and along narrow drainways. It occurs chiefly in the southern and southeastern parts of the county, where it is closely associated with Talbott, Maury, Etowah, Lindside, and Melvin soils. Its parent material washed from upland soils underlain by noncherty limestone. The cover was deciduous forest. The textural profile is not well defined.

Profile description :

0 to 10 inches, brown mellow silt loam ; 6 to 18 inches thick.

10 to 30 inches, brown, light-brown, or reddish-brown friable silt loam or silty clay loam ; 10 to 30 inches thick.

30 inches +, brown or light-brown friable silt loam or silty clay loam spotted with gray ; 0 to 5 feet or more thick.

This soil is medium acid, moderately high in organic matter and plant nutrients, and permeable to air, roots, and water. External and internal drainage are moderate, and the water-holding capacity is high. In most places the profile is free of stones or chert, but in a few places some chert fragments are on the surface and throughout the soil. The depth to bedrock is variable but generally more than 3 feet. Bedrock outcrops are uncommon.

Several variations were included in mapping. In some areas the colluvium contains admixed cherty limestone material and has a grayish-brown surface soil and a lighter texture. Other areas consist of recent colluvium washed from severely eroded upland soils. Those soils formed from colluvium that washed from stony land are much heavier textured than the soil described and are a dark grayish brown. All of these variations have use and management requirements similar to Emory silt loam but are decidedly less productive in most places.

Present use and management.—Nearly all of Emory silt loam is cleared and is being cropped. About 50 percent is used for corn, 10 percent for cotton, 15 percent for hay, and 15 percent for miscellaneous crops and pasture. The rest is in woodland or idle open land. Yields are relatively high, though fertilizers are not commonly used. Under ordinary management expected yields are 40 bushels of corn, 360 pounds of cotton, and 1.6 tons of lespedeza. A total of 86 acres of this soil is covered by Kentucky Reservoir.

Use and management requirements.—Emory silt loam is easily tilled, excellent in moisture conditions, and high in fertility. It is one of the most productive soils of the county, and suited to intensive use. Productivity could be increased by rotating the crops and by adequate and proper fertilization. The rotation could be short but should include a legume. Alfalfa and red clover can be successfully grown if lime and phosphate are added. All crops will respond to phosphate, though good yields are obtained without using any fertilizer. With good management expectable acre yields are : Corn, 65 bushels ; cotton, 520 pounds ; and lespedeza hay, 1.8 tons.

Ennis silt loam (0–3% slopes) (Ed).—Long narrow strips of this soil occur along creeks in all parts of the Limestone Hills section. It is closely associated with Humphreys soils of the terrace lands, Greendale soils of the colluvial lands, and Bodine soils of the uplands. In most places it is included in fields with Greendale and Humphreys soils.

The soil is similar to the Huntington in drainage and many profile characteristics, but it formed from a less general type of alluvium—material washed almost entirely from upland soils underlain by cherty limestone. Some loess is probably included in the parent material in most places. Development took place on nearly level flood plains under deciduous forest.

Profile description :

0 to 12 inches, grayish-brown to light-brown friable silt loam ; 6 to 18 inches thick.

12 to 24 inches, light-brown friable silt loam ; 8 to 20 inches thick.

24 inches +, light-brown or grayish-brown friable silt loam or cherty silt loam spotted with gray ; in most places, more cherty with depth ; stratified alluvium at 3 to 5 feet.

This soil is medium to strongly acid, moderately high in organic matter and plant nutrients, and high in water-holding capacity. All parts of it are readily permeable to air, roots, and water. External drainage is slow, but internal drainage is moderate. Some water-worn chert occurs on the surface and throughout the profile in most places, but not enough to interfere with cultivation. The quantity of chert in the lower layers is highly variable; loose beds of chert at shallow depths greatly lower the water-holding capacity in a few places.

Present use and management.—Except for 763 acres permanently flooded, nearly all of Ennis silt loam is cleared and used for crops or pasture. About 60 percent is used for corn, 5 percent for peanuts, and the rest chiefly for hay and forage crops. Fertilizers are not commonly used; the soil is kept in row crops almost continuously. Under ordinary management acre yields are 35 bushels of corn, 800 pounds of peanuts, and 1.4 tons of lespedeza hay.

Use and management requirements.—Ennis silt loam is somewhat limited in use suitability because it is susceptible to flooding. In places scouring or deposition of sandy or gravelly material is harmful. Ordinarily, flooding benefits the soil by adding sediments high in plant nutrients. The soil has good tilth and can be worked over a wide range of moisture content. It is well suited to peanuts, but the quality and yield are not so good as on the adjacent Humphreys soils. It is more productive of corn, however, than the Humphreys soils.

The productivity of Ennis silt loam can be increased considerably by adding adequate fertilizer and some lime and by using a suitable rotation. Because the soil has favorable physical characteristics, good response to fertilizer can be expected. Phosphate and nitrogen are needed, and potash is likely necessary, especially for legumes. The rotation should include legumes or legume-grass mixtures. It seems advisable to rotate corn with legumes that can be cut for hay or turned under.

The risk of loss from flooding makes it inadvisable to grow winter grains in many areas. Good yields of corn can be obtained year after year by using liberal applications of fertilizer, especially phosphate and nitrogen. Many farmers grow alternate rows of corn and soybeans, or soybeans in the row with the corn. Either practice is considered good, especially in places where the crop is to be hogged off. The yield of corn is not greatly decreased by interplanting, and the total yield of protein feed is increased. Under good management expectable acre yields are 65 bushels of corn, 1,000 pounds of peanuts, and 1.6 tons of lespedeza hay.

Ennis cherty silt loam (0-3% slopes) (Ec).—This cherty well-drained first bottom soil occurs along streams in all parts of the Limestone Hills section. It is closely associated with Humphreys, Greendale, and Bodine soils. It has formed from alluvium washed

chiefly from upland soils underlain by cherty limestone. It differs from Ennis silt loam in having more chert on the surface and throughout the profile. Water-worn chert fragments interfere materially with cultivation.

Profile description :

- 0 to 12 inches, grayish-brown or light-brown friable cherty silt loam; 6 to 18 inches thick.
- 12 to 24 inches, light-brown cherty silt loam spotted with gray in lower part; 8 to 20 inches thick.
- 24 inches +, very cherty alluvium; stratified beds of chert and silt in places; 2 to 10 feet thick.

This soil is medium to strongly acid and medium in content of organic matter and plant nutrients. It is very permeable to air, roots, and water. External drainage is moderate, but internal drainage is rapid to very rapid. The water-holding capacity is variable, but low in most places. Workability is impaired by the numerous chert fragments, which render the soil nearly untillable in some places.

Present use and management.—The greater part of Ennis cherty silt loam is cleared and used for crops. Corn is the principal crop, but other crops common to the area are also grown. A larger percentage of this soil is used for pasture than of the Ennis silt loam. Crop yields are much lower than for that soil. Under ordinary management about 18 bushels of corn, 600 pounds of peanuts, and 0.8 ton of lespe-deza hay an acre are expected.

Use and management requirements.—Ennis cherty silt loam has limited use suitability because it is periodically flooded. It is suited to many common crops, however, including corn, peanuts, hay, and most forage crops. It is difficult to till because of chertiness. Crop yields are moderate, chiefly because the water-holding capacity is low. Use and management requirements are similar to those for Ennis silt loam, but the response to good management is not so great. Under good management average expectable acre yields are: Corn, 40 bushels; peanuts, 700 pounds; and lespe-deza hay, 1.4 tons.

Etowah gravelly silt loam, hilly phase (12–30% slopes) (E_f).—Old high terraces of the Tennessee River, chiefly those in the southern part of the county, are occupied by this well-drained gravelly soil. The soil is associated with Pickwick and Paden soils and other Etowah soils. It has developed from mixed alluvium that probably washed chiefly from upland soils underlain by limestone. The vegetation was deciduous forest.

Profile description :

- 0 to 8 inches, grayish-brown loose gravelly silt loam; 6 to 12 inches thick.
- 8 to 30 inches, reddish-brown or brownish-red friable gravelly silty clay loam; 20 to 30 inches thick.
- 30 inches +, brownish-red friable gravelly silty clay loam that grades into loose beds of gravel; 5 to 20 feet or more thick.

The subsoil layers are very gravelly, and gravel in the surface layer interferes materially with cultivation. The soil is very permeable to air, roots, and water but has a very low water-holding capacity. Both internal and external drainage are rapid to very rapid. The soil apparently has a moderately high content of organic matter and plant nutrients. It is medium acid.

Some soils mapped with this phase vary considerably in many characteristics. About 86 acres have 5- to 12-percent slopes and are on

narrow ridge crests rather than ridge slopes. Also, small areas of chert-free Pickwick soils are included.

Present use and management.—Practically all of Etowah gravelly silt loam, hilly phase, is forested, chiefly with red and white oaks and hickory. All areas have been cut over a number of times and the present stand is young. Timber grows moderately fast.

Use and management requirements.—The phase is not suitable for crops, chiefly because of its steep slopes, high gravel content, and low water-holding capacity. Though poorly suited to that use, it probably would produce and sustain fair pasture. Lime and phosphate are needed to establish a good pasture mixture, and moderate applications of phosphate as top dressing will probably be needed yearly to maintain the stand. The pasture mixture should include one or more legumes. Grazing should be carefully controlled so as to maintain a good sod at all times. The pastures probably will have a low carrying capacity except in seasons of high rainfall. The soil is highly susceptible to injury from erosion. Unless good management is to be practiced, it is probably best left in forest.

Etowah gravelly silt loam, eroded hilly phase (12–30% slopes) (Ee).—This gravelly well-drained soil occurs on the ridge slopes of old high Tennessee River terraces, chiefly in the southern part of the county. It is associated with Paden, Pickwick, Emory, Lindside, and Melvin soils and other Etowah soils. It differs from Etowah gravelly silt loam, hilly phase, principally in being eroded. The parent material consists of old mixed alluvium washed mainly from upland soil underlain by limestone.

Profile description :

0 to 6 inches, light-brown or grayish-brown loose gravelly silt loam; 0 to 8 inches thick.

6 to 28 inches, reddish-brown or brownish-red friable gravelly silty clay loam; 20 to 30 inches thick.

28 inches +, brownish-red friable gravelly silty clay loam that grades into loose gravel beds; 5 to 20 feet or more thick.

A substantial part of the original surface layer has been lost as a result of erosion. The present surface layer is decidedly more gravelly than that of the uneroded soil, for the finer separates have been removed, and as a result gravel has accumulated on the surface. Gravel in the plow layer would interfere materially with cultivation, even if it were otherwise feasible.

The soil is medium to strongly acid and low in organic matter. It is very permeable to air, roots, and water but has a very low water-holding capacity. Internal and external drainage are rapid to very rapid.

Present use and management.—All of Etowah gravelly silt loam, eroded hilly phase, is cleared and has been used for crops and pasture. Now, it is largely wasteland or in unimproved pasture. A small part is used for crops, but yields are very low. Soil improvement or maintenance is not attempted in many places.

Use and management requirements. The soil is very poorly suited to crops requiring tillage and poorly suited to pasture. Fair pastures could be established and maintained but they would require liberal applications of lime and phosphate. Carefully controlled grazing will be necessary to maintain a good sod and prevent further erosion.

Pasture yields will probably be low except during the rainy seasons, for the water-holding capacity of the soil is low.

Etowah gravelly silt loam, severely eroded hilly phase (12–30% slopes) (Eg).—Ridge slopes on old high terraces of the Tennessee River, chiefly in the southern part of the county, are occupied by this soil. The old mixed alluvium from which it has formed washed chiefly from upland soils underlain by limestone.

Profile description:

- 0 to 4 inches, light-brown or reddish-brown friable gravelly silt loam; 0 to 6 inches thick.
- 4 to 26 inches, reddish-brown or brownish-red gravelly silty clay loam; 20 to 30 inches thick.
- 26 inches +, brownish-red friable gravelly silty clay loam that grades into beds of gravel; 5 to 20 feet thick.

Erosion has removed most of the original surface soil and part of the subsoil. Silt and other fine separates have largely been lost from the surface soil, so gravel has accumulated on the surface. Sheet erosion has been severe, but gulying is not common. The soil is gravelly throughout, and in most places the quantity increases with increasing depth. Gravel in the surface layer would interfere materially with cultivation.

The soil is medium to strongly acid and low to very low in organic matter and plant nutrients. It is readily permeable and has a very low water-holding capacity. Both internal and external drainage are rapid to very rapid.

Present use and management.—All of Etowah gravelly silt loam, severely eroded hilly phase, has been cleared and used for crops and pastures, but poor use or poor management, likely both, allowed severe erosion. Practically all of the soil is now wasteland.

Use and management requirements.—This phase is not suitable for crops or pasture, chiefly because of its strong slopes, high gravel content, low fertility, and low water-holding capacity. In its present condition it is probably best for forest, though it is poorly suited to that use and will be difficult to reforest.

Etowah gravelly silt loam, steep phase (30+ % slopes) (EH).—This steep gravelly well-drained soil occupies high Tennessee River terraces in the southern part of the county. It differs from Etowah gravelly silt loam, hilly phase, in having steeper slopes and a less distinct textural profile. The old mixed alluvium from which it has developed washed chiefly from upland soils underlain by limestone.

Profile description:

- 0 to 8 inches, grayish-brown loose gravelly silt loam; 6 to 12 inches thick.
- 8 to 24 inches, reddish-brown friable gravelly silt loam or silty clay loam; 10 to 20 inches thick.
- 24 inches +, brownish-red friable gravelly silt loam or silty clay loam that grades into beds of gravel in most places; 5 to 20 feet thick.

The soil is gravelly throughout; gravel in the surface layers would interfere materially with cultivation, if it were otherwise feasible. The soil is very permeable and has a very low water-holding capacity. Drainage, both external and internal, is very rapid. The soil has a moderately high content of organic matter and plant nutrients and is medium acid.

Present use and management.—Practically all of Etowah gravelly silt loam, steep phase, is in deciduous forest consisting chiefly of red and white oaks and hickory. The timber grows at a fair rate, but most areas have been cut over many times and the stand is therefore small and includes many culls.

Use and management requirements.—Steepness, high gravel content, and low water-holding capacity make this soil unsuitable for crops or pasture. It is best used for forestry.

Eupora fine sandy loam (2-5% slopes) (Eκ).—This imperfectly drained gently sloping soil of the colluvial lands occurs in small areas widely distributed throughout the Coastal Plain section. It is associated chiefly with Alva, Hymon, Beechy, Cuthbert, Ruston, Savannah, and Dulac soils. External drainage is moderate, but internal drainage is slow. In most places the imperfect drainage results because of seepage from the adjacent upland.

The colluvium or local alluvium from which the soil has developed washed from upland soils derived from loess and Coastal Plain materials. The alluvium is highly mixed but Coastal Plain sand predominates. Development took place under a deciduous forest. The soil differs from Alva fine sandy loam chiefly in drainage and associated characteristics, and from the Briensburg soil chiefly in having Coastal Plain materials mixed with the loess material in the colluvium.

This soil varies considerably in degree of profile development from place to place. Generally it does not have a distinct textural profile.

Profile description :

- 0 to 10 inches, grayish-brown loose fine sandy loam; 6 to 12 inches thick.
- 10 to 16 inches, light-brown friable fine sandy loam; 0 to 10 inches thick.
- 16 inches +, very friable fine sandy loam mottled with gray, light brown, and rust brown; 1 to 5 feet thick.

This soil—strongly to very strongly acid throughout—is moderately low in organic matter but has more than the upland soils with which it is associated. External drainage is slow. The water-holding capacity is high, but the fluctuating high water table prevents deep root development; consequently, crops do not make maximum use of soil moisture.

Present use and management.—Eupora fine sandy loam is used and managed like Alva fine sandy loam but on the average it yields less. About 40 percent of the soil is used for corn, 5 percent for cotton, 20 percent for hay and pasture, and 10 percent for miscellaneous crops. Approximately 25 percent is idle open land or wooded. Only 2 acres are covered by the Kentucky Reservoir.

The soil is managed like the Hymon and Beechy soils of the adjacent bottom lands and usually occurs in the same fields with them. Crops are not systematically rotated; fertilizer is ordinarily applied only to cotton. Under ordinary management average acre yields are: Corn, 22 bushels; cotton, 240 pounds; and lespedeza hay, 1 ton.

Use and management requirements.—Eupora fine sandy loam is suited to most crops commonly grown in the county. Its suitability for crops is not significantly limited by its imperfect drainage, but average yields are lower than on the well-drained Alva soil. In wet seasons crops are injured by the high water table and yields are less than on the well-drained soil, but in dry seasons yields may be as high.

Crop yields can be significantly increased by proper rotations, which

presumably can be short but should include a legume crop, preferably one to be turned under. The legume crop needs lime and phosphate. Cotton and most other crops need a complete fertilizer containing a fairly high quantity of potash. Potash fertilizer aids in preventing rust, to which cotton is subject on this soil.

The soil is not especially susceptible to erosion. Diversion ditches at the foot of adjacent upland slopes improve drainage in many places. Under good management expectable acre yields are 40 bushels of corn, 380 pounds of cotton, and 1.1 tons of lespedeza hay.

Freeland silt loam, undulating phase (2-5% slopes) (Fd).—Most of this soil occurs along the Beech River and Doe, Turkey, and Panther Creeks. It is associated chiefly with Dexter, Hatchie, Almo, Hymon, and Beechy soils. The old mixed alluvium from which it has developed washed from upland soil derived from loess or Coastal Plain materials. A thin layer of loess overlies the alluvium in many places. The soil has developed under a deciduous forest consisting chiefly of oaks. It is similar to the Paden soils in drainage and many profile characteristics but differs from them chiefly in having formed from a different type of alluvium. The alluvium under the Paden soils washed chiefly from soils underlain by limestone.

Profile description:

- 0 to 8 inches, yellowish-gray mellow silt loam; 6 to 10 inches thick.
- 8 to 24 inches, yellowish-brown to brownish-yellow friable silty clay loam; 12 to 40 inches thick.
- 24 to 42 inches (siltpan) compact silt loam to silty clay loam mottled with gray, yellow, and brown; 14 to 20 inches thick.
- 42 inches +, yellowish-brown to reddish-brown firm clay loam or fine sandy clay loam spotted with yellow and gray; 2 to 15 feet thick.

The surface and subsoil layers are free of gravel, but layers below the siltpan may contain some gravel. The soil is strongly to very strongly acid and low in organic matter, plant nutrients, and water-holding capacity. The surface soil and subsoil layers are permeable to air, roots, and water, but the siltpan is only slightly permeable.

This soil actually has silt loam, loam, and fine sandy loam surface soils, but the silt loam dominates. About equal areas of uneroded and slightly eroded soil are included. The variations in surface soil texture and the slight erosion do not significantly affect use and management requirements or productivity.

Present use and management.—A large part of Freeland silt loam, undulating phase, is wooded, chiefly with oaks. About 25 percent of the cleared area is used for cotton, 40 percent for corn, 20 percent for hay and pasture, and 15 percent for miscellaneous uses. Cotton is usually inadequately fertilized; other crops are normally not fertilized. Different crops are grown, but not in systematic rotation. Under ordinary management average acre yields are 20 bushels of corn, 260 pounds of cotton, 0.9 ton of lespedeza hay.

Use and management requirements.—The undulating phase of Freeland silt loam is physically well suited to crops or pasture. It has a mild relief and good tilth and responds to good management. Disadvantages are the low content of organic matter and plant nutrients, the low water-holding capacity, and the strong to very strong acidity. Chiefly because of low fertility, the soil has relatively low productivity and is somewhat limited in use suitability. Under good man-

agement expectable acre yields are: Corn, 43 bushels; cotton, 440 pounds; and lespedeza hay, 1.5 tons.

Freeland silt loam, eroded undulating phase (2-5% slopes) (F_B).—Areas of this eroded moderately well drained siltpan soil occur along most major streams flowing from the loess Plain and Coastal Plain sections. The soil lies on high terraces and is associated chiefly with Dexter, Hatchie, and Almo soils and other Freeland soils. It differs from Freeland silt loam, undulating phase, chiefly in having lost a part of its surface soil by erosion. The soil has developed under a deciduous forest vegetation. The parent material consists of old mixed alluvium that washed from upland soils derived from loess or Coastal Plain materials. Loess has contributed to the parent material in many places.

Profile description:

- 0 to 6 inches, grayish-yellow to yellowish-gray mellow silt loam; 0 to 8 inches thick.
- 6 to 22 inches, yellowish-brown to brownish-yellow friable silty clay loam; 12 to 20 inches thick.
- 22 to 40 inches (siltpan) compact silt loam to silty clay loam mottled with gray, yellow, and brown; 14 to 20 inches thick.
- 40 inches +, yellowish-brown to reddish-brown firm clay loam or fine sandy clay loam spotted with yellow and gray; 2 to 15 feet thick.

A substantial part of the original surface soil, including the thin layer of higher organic-matter content, has been lost as a result of erosion. The original surface layer still constitutes the plow layer in most places, though in a few all this layer may be gone.

The soil is strongly to very strongly acid and low in organic matter, plant nutrients, and water-holding capacity. Its surface soil and subsoil are permeable to air, roots, and water, but the siltpan is only slightly permeable. External drainage is moderate; internal drainage, moderately slow.

Included with this phase are about 400 acres that have a loam or fine sandy loam surface layer and somewhat sandier subsoil layers. Also included are a few severely eroded areas of such small acreage as to be relatively insignificant.

Present use and management.—All of Freeland silt loam, eroded undulating phase, is cleared, and most of it is now cropped. About 25 percent is used for cotton, 35 percent for corn, 20 percent for hay and pasture, and 10 percent for miscellaneous crops. Approximately 10 percent is left idle. The crops are not grown with any regard to maintaining or improving productivity. Cotton generally receives about 200 pounds of 4-10-4 mixture an acre; other crops are not commonly fertilized. Under ordinary management average acre yields are 18 bushels of corn, 240 pounds of cotton, and 0.8 ton of lespedeza hay.

Use and management requirements.—Freeland silt loam, eroded undulating phase, is physically well suited to crops but low in productivity. It responds to good management, however, and yields can be greatly increased by using crop rotations that include legumes and grasses. The right kind of fertilizer applied in adequate amounts is also important. All crops need liberal fertilization. The legumes need lime and phosphate and possibly potash. Phosphate is required by all crops.

Potash and nitrogen should be applied according to the need of the current crop. The quantity required will be greatly influenced by the crops previously grown and the treatment they received. Cotton and certain legume crops especially need phosphate. Nitrogen can be supplied by frequently including a legume crop in the rotation.

The supply of organic matter is low and probably should be increased and maintained at a higher level. Growing of grasses, green manuring, and applying barnyard manure will aid in increasing the supply of organic matter. Winter cover crops, preferably legumes, should follow the intertilled crop. They aid in preventing erosion and add valuable nitrogen and organic matter.

Under good management expectable average acre yields are 40 bushels of corn, 400 pounds of cotton, and 1.4 tons of lespedeza hay.

Freeland silt loam, rolling phase (5-12% slopes) (Fc).—Very small areas of this soil occur on terraces along many streams that drain the Loess Plain and Coastal Plain sections. They are associated with Dexter, Hatchie, Almo, Hymon, and Beechy soils. The soil differs from Freeland silt loam, undulating phase, chiefly in having steeper slopes. It has developed from old mixed alluvium washed from upland soils derived from loess and Coastal Plain materials. The forest vegetation consists chiefly of oaks.

Profile description:

- 0 to 8 inches, yellowish-gray mellow silt loam; 6 to 8 inches thick.
- 8 to 24 inches, yellowish-brown to brownish-yellow friable silt loam; 12 to 20 inches thick.
- 24 to 40 inches (siltpan) compact silt loam to silty clay loam mottled with gray, yellow, and brown; 14 to 20 inches thick.
- 40 inches +, yellowish-brown to reddish-brown clay loam splotted with yellow and gray; 2 to 15 feet thick.

The surface soil and subsoil are free of gravel, but layers below the siltpan have some gravel in places. The soil is strongly to very strongly acid and low in organic matter, plant nutrients, and water-holding capacity. The surface soil and subsoil are permeable to air, roots, and water, but the siltpan is only slightly permeable.

Present use and management.—Practically all of Freeland silt loam, rolling phase, is wooded, chiefly with red, white, post, and blackjack oaks, hickory, elm, and dogwood. All areas have been cut over; trees in the present stand are small and grow slowly.

Use and management requirements.—This phase is physically well suited to most of the common crops, but chiefly because of its stronger slopes, it is not so well suited to them as the undulating phase. It is highly susceptible to erosion when cultivated. If productivity is to be maintained or increased, erosion should be checked by using long rotations that consist chiefly of close-growing crops, including legumes and grasses. Proper kinds of fertilizer applied in adequate amounts are also necessary. The need for terraces or other devices for controlling runoff will depend largely on other management. If cleared, this soil would be used and managed much like Freeland silt loam, eroded rolling phase.

Freeland silt loam, eroded rolling phase (5-12% slopes) (FA).—This moderately well drained siltpan soil occurs on high terraces along major streams draining the Loess Plain and Coastal Plain sec-

tions. It has developed from old alluvium consisting of loess and Coastal Plain sand and clay.

Profile description :

- 0 to 6 inches, grayish-yellow mellow silt loam; 0 to 8 inches thick.
- 6 to 22 inches, yellowish-brown to brownish-yellow friable silty clay loam; 12 to 20 inches thick.
- 22 to 38 inches (siltpan) compact silt loam to silty clay loam mottled with gray, yellow, and brown; 14 to 20 inches thick.
- 38 inches +, yellowish-brown or reddish-brown clay loam or fine sandy clay loam splotched with yellow and gray; 2 to 15 feet thick.

Much of the original surface layer, including the thin layer higher in organic-matter content, has been eroded away. To some degree subsoil and surface soil have been mixed in the plow layer, but over much of the area the original surface layer constitutes the entire plow layer. In some small areas, however, all of the original surface layer is missing and the subsoil is exposed.

The soil is strongly to very strongly acid and low in organic matter, plant nutrients, and water-holding capacity. The surface soil and subsoil are permeable, but the siltpan is only slightly permeable. External drainage is moderate, and internal drainage is moderately slow.

This phase includes about 100 acres in which the surface soil is loam or fine sandy soil. This inclusion is used and managed like the rest of the phase.

Present use and management.—All of Freeland silt loam, eroded rolling phase, has been cleared and used for crops or pasture. About 25 percent is now used for corn, 15 percent for cotton, 20 percent for hay and pasture, and 10 percent for miscellaneous crops. About 30 percent lies idle. Crops are systematically rotated on only a few farms. Cotton is the only crop regularly fertilized; the common application is about 200 pounds of a low-analysis complete fertilizer. Some lime and phosphate have been used on hay crops recently. Other crops commonly are not fertilized. Under ordinary management average yields are 16 bushels of corn, 220 pounds of cotton, and 0.7 ton of lespedeza hay an acre.

Use and management requirements.—Chiefly because of its stronger slopes, this soil is less desirable for crops than Freeland silt loam, eroded undulating phase. Nevertheless, it is suitable for nearly all crops grown in the county. It is highly susceptible to and greatly injured by erosion; therefore, rotations should be long and should include close-growing crops as much of the time as feasible. Cultivate on the contour, and where slopes are long, consider the use of contour strip cropping. Terraces may or may not be necessary, depending largely on other management. Fertilization requirements are similar to those of the eroded undulating phase. Under good management average acre yields are 35 bushels of corn, 380 pounds of cotton, and 1.2 tons of lespedeza hay.

Freeland silty clay loam, severely eroded rolling phase (5-12% slopes) (F_E).—This moderately well drained severely eroded siltpan soil has formed from old alluvium that washed from upland soils, which were derived from Coastal Plain and loess materials. It lies on high terraces along most major streams draining the Loess Plain and Coastal Plain sections and is closely associated with Dexter, Hatchie, Almo, Hymon, and Beechy soils.

Profile description :

- 0 to 4 inches, grayish-yellow to brownish-yellow friable silty clay loam; 0 to 6 inches thick.
- 4 to 20 inches, yellowish-brown to brownish-yellow friable silty clay loam; 12 to 20 inches thick.
- 20 to 36 inches (siltpan) compact silt loam to silty clay loam mottled with gray, yellow, and brown; 14 to 20 inches thick.
- 36 inches +, yellowish-brown or reddish-brown clay loam or fine sandy clay loam splotted with yellow and gray; 2 to 15 feet thick.

In most places nearly all of original surface soil has been lost and the plow layer consists almost entirely of the topmost part of the subsoil. Small shallow gullies, a few not crossable with heavy machinery, are common. Small spots retaining most of the original surface soil are common in intergully areas.

The soil is very strongly acid and low in organic matter and plant nutrients. Its subsoil is permeable to air, roots, and water, but its siltpan is only slightly permeable. The water-holding capacity is very low. External drainage is moderate to rapid, and internal drainage is moderately slow.

Included with this phase in mapping are about 100 acres having a clay loam or fine sandy clay loam surface soil; this area is not significantly different from the soil described in use and management requirements.

Present use and management.—All of Freeland silty clay loam, severely eroded rolling phase, has been cleared and used for crops and pasture, but now it is largely abandoned. In most places the soil was kept almost continuously in row crops until yields became extremely low. A considerable part of the erosion probably occurred after the soil was abandoned.

Use and management requirements.—This soil has been greatly injured by erosion and now has very low productivity for crops and pasture. Probably it is best used and managed for pasture. Applications of lime and phosphate, and possibly potash, will be necessary to establish and maintain good pastures. Even under good management this soil should not be expected to produce much pasture except during wet seasons.

If it is necessary to use this soil for crops, rotations should be long and consist chiefly of close-growing crops, including legumes and grasses. Deep-rooted legumes are difficult to establish, but sericea and sweetclover can be established and maintained if lime and phosphate are applied. Fertilizers are essential for all crops. Cultivation should be on the contour, and if the slopes are long, strip cropping may be advisable. Terraces will probably be necessary to aid in controlling runoff and erosion until vegetation is well established. Crop yields may be low even under good management.

Greendale cherty silt loam, undulating phase (2-5% slopes) (Gb).—Gently sloping fans formed by small streams emerging onto the flood plains of larger streams, narrow bottoms along deeply entrenched stream beds, or narrow sloping areas at the foot of steep slopes are occupied by this soil. Small areas are widely distributed throughout the Limestone Hills section in close association with Bodine, Humphreys, Ennis, and Dickson soils. The soil has formed at the foot of upland slopes from local alluvium or colluvium. This

parent material came from uplands underlain by cherty limestone. The deciduous forest under which the soil developed consists chiefly of white and red oaks and hickory. The soil is young and does not have a well-developed textural profile.

Profile description:

- 0 to 10 inches, grayish-brown or brownish-gray friable cherty silt loam; 6 to 14 inches thick.
- 10 to 20 inches, light-brown or yellowish-brown friable cherty silt loam splotted with gray; 0 to 10 feet thick.

All parts of the profile contain many chert fragments varying from about $\frac{1}{2}$ to 4 inches in diameter. Chert in the surface layer materially interferes with cultivation.

The soil is medium to strongly acid. It has a moderately low supply of organic matter but more than the adjacent upland soils. The entire profile is very porous and extremely permeable to air, roots, and water; therefore, it is low in water-holding capacity. External drainage is moderate; internal drainage is rapid.

Present use and management.—About 15 percent of Greendale cherty silt loam, undulating phase, is wooded; 55 percent is used for corn, 5 percent for peanuts, 5 percent for cotton, 10 percent for miscellaneous crops, and 10 percent for gardens and farmsteads. Most of the houses and practically all of the gardens in the Limestone Hills section are on this soil. Fertilizers are seldom used except on farm gardens; crops are not systematically rotated, though many kinds of crops are grown. Under ordinary management average acre yields are 25 bushels of corn, 700 pounds of peanuts, and 1.1 tons of lespedeza hay.

Use and management requirements.—Greendale cherty silt loam, undulating phase, is well suited to intensive cropping, but chert fragments interfere with cultivation. Extremely good drainage and aeration make the phase well suited to early vegetables. Field crops, especially corn, are highly susceptible to drought injury. The soil is therefore better suited to drought-resistant or early maturing crops.

The productivity of this soil undoubtedly can be increased by improved management. It produces fairly well without fertilization but is highly responsive to fertilizer and lime. All crops need phosphate, and possibly potash. The legume crop needs lime, and all except the legume crop and the crop immediately following, need nitrogen. The rotation presumably could be short but should include a legume. Correct crop rotation and fertilization should increase yields. Likewise, application of barnyard manure or the turning under of green manure should be highly beneficial. The soil is similar to Humphreys cherty silt loam in use and management requirements. Under good management expectable acre yields are 40 bushels of corn, 800 pounds of peanuts, and 1.3 tons of lespedeza hay.

Greendale cherty silt loam, rolling phase (5–12% slopes) (G_A).—This well-drained cherty soil of the colluvial lands is widely distributed throughout the Limestone Hills section, where it is associated with Bodine, Dickson, Humphreys, and Ennis soils. It differs from Greendale cherty silt loam, undulating phase, chiefly in having stronger slopes. The depth of the colluvial deposit is also less in most places. The parent material has washed from adjacent upland

slopes, the soils on which are underlain by cherty limestone. The individual areas average less than 4 acres in size.

Profile description :

- 0 to 10 inches, grayish-brown to brownish-gray friable cherty silt loam ; 6 to 14 inches thick.
- 10 to 20 inches, light-brown or yellowish-brown friable cherty silt loam or light silty clay loam ; 8 to 16 inches thick.
- 20 inches +, brownish-yellow very cherty silt loam spotted with gray ; 0 to 10 feet thick.

The soil is medium to strongly acid throughout ; moderate to low in organic matter and plant nutrients ; and extremely permeable to air, roots, and water. Its water-holding capacity is low. External drainage is moderate, and internal drainage is rapid. All layers are cherty, and chert in the surface layer interferes materially with cultivation.

Some cherty colluvial areas mapped with this phase have a well-developed textural profile. The soils of these included areas are less productive and are more highly susceptible to erosion. In most places, however, they occur in a complex association with this young colluvial soil and are used and managed similarly.

Present use and management.—Greendale cherty silt loam, rolling phase, is used and managed in about the same way as Greendale cherty silt loam, undulating phase. A larger part is woodland. In many places areas are not cleared unless they are part of a larger field of crop-adapted soils. Crop yields are somewhat lower and more variable than on the undulating phase.

Use and management requirements.—Owing to stronger slopes and smaller individual areas, this soil is inferior to the undulating phase for crops. The cleared areas are moderately susceptible to erosion, and because smaller particles have been removed by erosion, there is an accumulation of chert fragments on the surface in many places. The use and management requirements are very similar to those of the undulating phase.

Hatchie silt loam (1-3% slopes) (Hb).—Most of this imperfectly drained siltpan soil occurs on nearly level areas on the broader terraces of major streams draining the Loess Plain and Coastal Plain sections. It occurs chiefly along Doe, Panther, and Turkey Creeks. In most places it lies between the poorly drained Almo soil of the level or slightly depressional areas and the moderately well-drained Freeland soils of the gently sloping to sloping areas.

The parent material consists of old mixed alluvium washed from upland soil derived from loess or Coastal Plain sand and clay. The deciduous forest under which the soil developed includes many water-tolerant trees.

The soil is intermediate between the Freeland and Almo in drainage, general crop adaptation, and productivity. It resembles the Taft soil of the high Tennessee River terraces in drainage and associated profile characteristics.

Profile description :

- 0 to 10 inches, gray or yellowish-gray mellow silt loam ; 8 to 12 inches thick.
- 10 to 22 inches, pale-yellow friable silty clay loam spotted with gray in lower part ; 8 to 14 inches thick.

22 to 44 inches (siltpan), very compact silt loam to silty clay loam, predominantly gray but splotched with yellow; 18 to 24 inches thick.

44 inches +, gray to mottled gray and yellow moderately friable clay loam or silty clay loam; 2 to 15 feet thick.

This soil is very strongly acid and low in organic matter and plant nutrients. Its surface soil and subsoil are permeable to roots and water, but the siltpan is very slightly permeable. Internal and external drainage are very slow. The water-holding capacity is low.

Present use and management.—Most of Hatchie silt loam has been cleared and is now used for crops and pasture. In most places the small areas are associated with Freeland silt loam, undulating phase, and are used and managed like that soil. Nevertheless, the requirements of the two soils differ considerably. Average crop yields on the Hatchie soil are very low; complete crop failures are common.

Use and management requirements.—Slow drainage somewhat limits the use suitability of Hatchie silt loam. Artificial drainage should broaden the use suitability but the soil is difficult to drain because it has a slowly permeable siltpan and lies at the centers of broad level terraces. The water table, near the surface during rainy seasons, prevents deep root penetration. Also, the water-holding capacity is low, and this, with the restricted root system, causes severe crop damage during extended droughts. During long dry periods crops are more damaged by lack of water on this soil than on the better drained Freeland and Dexter soils. Crops tolerant of excessive soil moisture should be selected. Lespedeza, redtop, soybeans, and sorghum are fairly well suited. Fertilization requirements are similar to those for Freeland silt loam, eroded undulating phase, but crop response to them is not so great. Under good management expectable acre yields are 30 bushels of corn, 1.2 tons of lespedeza hay, and 1.5 tons of soybean hay.

Hatchie fine sandy loam (1–3% slopes) (H_A).—This imperfectly drained soil occurs on nearly level to gently sloping terraces, chiefly along small streams in the Coastal Plain section of the county. In some places, however, it is in a foot-slope position and the material is old local alluvium or colluvium. The soil is closely associated with Hymon and Beechy soils of the bottom lands, Alva and Eupora soils of the colluvial lands, and Ruston, Cuthbert, and Savannah soils of the uplands.

The parent material consists of old mixed alluvium washed from upland soil that was derived principally from Coastal Plain materials but to some extent from loess. Since the terraces are low, they may be flooded infrequently.

Profile description :

0 to 10 inches, gray to yellowish-gray loose to friable fine sandy loam; 8 to 12 inches thick.

10 to 22 inches, pale-yellow friable clay loam or silty clay loam splotched with gray in the lower part; 8 to 14 inches thick.

22 to 40 inches, compact clay loam, predominantly gray but splotched with yellow; 16 to 20 inches thick.

40 inches +, gray moderately friable clay loam; 2 to 10 feet thick.

This soil is very strongly acid and low in organic matter and plant nutrients. The surface soil and subsoil are readily permeable to air, roots, and water, but the compact layer is only slightly permeable.

The compact layer is thinner and less compact than that of Hatchie silt loam, and consequently is more permeable to roots and water. Internal and external drainage are slow to very slow. The water-holding capacity is low.

Present use and management.—Practically all of Hatchie fine sandy loam is cleared and used for crops and pasture. It occurs in fields with Hymon and Beechy soils and is used similarly. Corn and lespedeza are the chief crops, but some cotton and other crops are also grown. Fertilization and crop rotation are not commonly practiced. Crop yields are very low under ordinary management.

Use and management requirements.—This soil is somewhat better suited to crops than Hatchie silt loam, chiefly because it has better surface drainage. Its use suitability is limited by imperfect internal drainage, which in some of the foot-slope positions is caused by seepage from the adjacent upland. An interception ditch at the base of the upland slope will improve the drainage of many of these areas. Fertilization and rotation of crops should be similar to those for Freeland silt loam, eroded undulating phase, but the response will probably not be so good. Under good management expectable acre yields are 30 bushels of corn, 1.2 tons of lespedeza hay, and 1.5 tons of soybean hay.

Hilly stony land (Talbot and Colbert soil materials) (12-30+ % slopes) (Hc).—This land type is in uplands underlain by massive limestone and shale. It occurs chiefly in the southeastern part of the county in the Talbot-Emory-Lindside soil association and on the lower ridge slopes associated with Talbot, Bodine, Emory, and Lindside soils. Numerous limestone outcrops prevent its use for crops. The forest consists chiefly of cedars, though in places it is predominantly deciduous.

About one-third to two-thirds of the surface is made up of limestone bedrock outcrops. The spaces between the outcrops are filled with heavy-textured soil material a few inches to 2 or 3 feet thick. This material has properties similar to those of the Talbot or Colbert soils. It is yellowish or reddish and ranges from silty clay loam to silty clay. In addition to bedrock outcrops, loose chert and limestone fragments are scattered over the land in many places. A narrow outcrop of black shale is included with this land type.

Present use and management.—Practically all of this land type is forested, chiefly with cedars that have been cut over a number of times. The stand is now sparse, and the trees small.

Use and management requirements.—This stony land is not suited to crops and very poorly suited to pasture. It is best suited as woodland, though a few of the less stony areas may be suitable for pasture.

Humphreys silt loam (2-5% slopes) (HE).—Moderate-sized areas of this well-drained soil lie on low terraces along major creeks in the Limestone Hills section, where they are closely associated with areas of Ennis, Greendale, Bodine, and Dickson soils. The alluvium from which this soil has developed washed mainly from upland soils underlain by cherty limestone but it contains in places a small admixture of loess or high-grade limestone materials. The deciduous forest consists chiefly of red and white oaks and hickory.

Profile description :

- 0 to 8 inches, grayish-brown or light brownish-yellow silt loam ; 6 to 10 inches thick.
- 8 to 30 inches, light-brown to yellowish-brown friable light silty clay loam ; 16 to 24 inches thick.
- 30 inches +, brownish-yellow heavy silt loam or cherty silt loam spotted with gray ; 2 to 10 feet thick.

The soil is strongly acid and medium in content of organic matter and plant nutrients. It is very permeable to air, roots, and water. External drainage is moderately slow; internal drainage is moderate. The water-holding capacity is high. Some small water-worn chert occurs in the surface layer in most places, but not enough to seriously interfere with tillage. The lower layers vary considerably in chert content and in many places are relatively cherty.

Present use and management.—Nearly all of Humphreys silt loam has been cleared and is being intensively cropped. Corn, peanuts, and lespedeza are the major crops, though a large variety of crops are grown to limited extent. Fertilizers are seldom used, and crops are not rotated systematically. Under ordinary management average yields are 30 bushels of corn, 900 pounds of peanuts, and 1.2 tons of lespedeza hay. Kentucky Reservoir covers 17 acres of this soil.

Use and management requirements.—This moderately fertile soil is productive of most crops common to the area. It occurs where there is only a small percentage of crop-adapted soil, so on most farms it must be cropped almost continuously. The soil should be well suited to intensive use. It can be tilled over a wide range of moisture conditions, has a high water holding capacity, and is not very susceptible to erosion. Crop yields can be maintained or increased by adequate and proper fertilization. The soil produces well without added fertilizer but it yields much more if fertilized and limed. A systematic rotation—presumably it could be a short one including a legume—should be followed if feasible. A legume cover crop should be planted after the intertilled crop and turned under as green manure. The legume crop needs lime and phosphate; all crops require phosphate to produce maximum yields. If legumes are not included in the rotation, all crops will need nitrogen. Under good management average acre yields are 60 bushels of corn, 1,200 pounds of peanuts, and 1.6 tons of lespedeza hay.

Humphreys cherty silt loam (2-5% slopes) (H_D).—Most of this well-drained cherty soil is on low terraces along small streams; it is widely distributed throughout the Limestone Hills section, where it occurs in association with Ennis, Greendale, Bodine, and Dickson soils. It has developed under a deciduous forest from alluvium that washed from upland soil underlain chiefly by cherty limestone.

Profile description :

- 0 to 8 inches, grayish-brown or light-brown friable cherty silt loam ; 6 to 10 inches thick.
- 8 to 30 inches, light-brown to yellowish-brown friable cherty silty clay loam ; 16 to 24 inches thick.
- 30 inches +, brownish-yellow very cherty silt loam spotted with gray ; 2 to 10 feet thick.

The soil is strongly to very strongly acid; medium in content of organic matter and plant nutrients; and extremely permeable to air, roots, and water. External drainage is moderate, and internal drain-

age is rapid. The water-holding capacity is moderately low. Chert fragments in the plow layer interfere materially with cultivation. In fact, chert fragments about $\frac{1}{2}$ to 6 inches in diameter constitute 25 to 50 percent of the soil mass.

Present use and management.—Most of Humphreys cherty silt loam is cleared and is being used for crops or pasture. All common crops of the area are grown to some extent, but principally corn, peanuts, and lespedeza. The soil is kept in row crops almost continuously. A crop of lespedeza hay or peanuts is sometimes substituted. Some lime and phosphate have been used recently, but adequate fertilization is not commonly practiced. Crops yield considerably less than on Humphreys silt loam. Under ordinary management average acre yields are: Corn, 18 bushels; peanuts, 700 pounds; and lespedeza hay, 0.7 ton.

Use and management requirements.—Humphreys cherty silt loam is suited to crops, but chert fragments in its plow layer materially interfere with cultivation. The soil has only moderate fertility and is relatively low in water-holding capacity. Crop yields are therefore fairly low. Use and management requirements are similar to those for Humphreys silt loam, but the response to improved management should not be expected to be as good. Under good management expectable acre yields are: Corn, 40 bushels; peanuts, 900 pounds; and lespedeza hay, 1 ton.

Huntington silt loam (0-3% slopes) (Hr).—This well-drained highly productive soil occurs in long narrow strips on the well-drained parts of first bottoms along the Tennessee River. It is closely associated with Egam, Bruno, Lindside, Melvin, Wolftever, and Sequatchie soils. The recent alluvium from which it formed is mixed, but it washed chiefly from upland soils underlain by limestone. Formation took place on nearly level flood plains under deciduous forest consisting of red and white oaks, hickory, elm, beech, maple, ash, and sycamore. This is a young soil with little horizon differentiation.

Profile description:

- 0 to 12 inches, brown or light-brown friable silt loam or heavy silt loam; 6 to 18 inches thick.
- 12 to 30 inches, light-brown friable heavy silt loam or silty clay loam; 10 to 30 inches thick.
- 30 inches +, light-brown friable silt loam splotted with gray; contains an appreciable quantity of sand in many places; 2 to 20 feet thick.

The soil is slightly acid to neutral and high in organic matter, plant nutrients, and water-holding capacity. It is moderately permeable to air, roots, and water. External drainage is moderately slow, but internal drainage is moderate.

Present use and management.—Practically all of Huntington silt loam is cleared, and 80 to 90 percent of it is in corn. Most of the rest is in lespedeza. Little of it is ever left idle. In most areas corn is grown year after year without fertilization or crop rotation. Fertilizers are seldom if ever used. Average acre yields under ordinary management are 45 bushels of corn and 1.8 tons of lespedeza hay. The Kentucky Reservoir covers 365 acres of this soil.

Use and management requirements.—Huntington silt loam is the most fertile and probably the most productive soil in the county for the crops to which it is suited. Its high natural fertility and dura-

bility, plus the deposition of fresh sediment by floodwaters, give it the ability to produce large crop yields year after year. It does respond to proper fertilization, and especially to nitrogen for crops like corn. Chiefly because it is susceptible to flooding, the use suitability of the soil is somewhat restricted.

Many hay and forage crops are suitable and are grown in rotation with corn on the less productive areas. Since the soil can be cropped almost continuously to corn without fertilization, improved management will be concerned chiefly with improved seedbed preparation, better tillage practices, and planting seed of higher yielding hybrid varieties. Under good management expectable acre yields are about 65 bushels of corn, 1.9 tons of lespedeza hay, and 2.2 tons of soybean hay.

Hymon silt loam (0-3% slopes) (HH).—Low first bottoms along most streams in the Loess Plain and Coastal Plain sections have fairly large areas of this soil. They are closely associated with Beechy and Shannon soils of the bottom lands and Briensburg soil of the colluvial lands. The mixed alluvium from which the soil has formed washed from upland soils derived from Loess or Coastal Plain materials. Loess material apparently predominates. The native vegetation is chiefly deciduous forest that includes a large proportion of water-tolerant trees. This soil is young and shows little horizon differentiation.

Profile description :

- 0 to 12 inches, grayish-brown or light-brown mellow silt loam ; 8 to 16 inches thick.
- 12 to 30 inches, mellow silt loam mottled with gray-brown or rust-brown ; 10 to 40 inches thick.
- 30 inches +, stratified layers of silt and sand highly mottled with gray, brown, and rust brown ; 2 to 10 feet thick.

The soil is free of stones and gravel, strongly to very strongly acid, and moderate to low in organic matter and plant nutrients. It is permeable and permits easy penetration of water, roots, and air, but it has an intermittently high water table and a subsoil saturated with water during wet seasons. The water-holding capacity is high. External drainage is very slow; internal drainage is slow.

Present use and management.—At present the Kentucky Reservoir covers 107 acres of Hymon silt loam. Of the rest, an estimated 60 percent is cleared. About 65 percent of the cleared area is planted to corn; 20 percent to hay, chiefly lespedeza; and most of the rest to crops such as sorghums and cotton. If spring months are exceptionally rainy, a large part of the soil may lie idle the entire year. In most areas corn is grown year after year without fertilization. In fact, fertilization is commonly practiced only for the small acreage of cotton. Under ordinary management average acre yields are 25 bushels of corn, 200 pounds of cotton, and 1.2 tons of lespedeza hay.

Use and management requirements.—The use suitability of Hymon silt loam is somewhat limited by imperfect drainage and susceptibility to flooding. It is well suited to corn, however, and to many hay and forage crops. Artificial drainage should broaden its use suitability. Open ditches and tile drains should be effective in improving internal drainage but they would not appreciably lessen flood damage.

The productivity of this soil has been lowered by continuous use for soil-depleting crops. Crop rotation and fertilization are necessary to increase yields. The rotation presumably can be short, but it should include a legume that is turned under to supply needed nitrogen. For high yields of most crops lime, phosphate, and possibly potash are needed. Cotton needs a complete fertilizer that includes a liberal amount of potash. Nitrogen fertilizer is not so badly needed for cotton as for other crops. Under good management expected acre yields are 50 bushels of corn, 320 pounds of cotton, and 1.4 tons of lespedeza hay.

Hymon fine sandy loam (0-3% slopes) (H₆).—This imperfectly drained soil occurs on low nearly level first bottoms throughout the Coastal Plain section and along larger streams flowing from that section. Its fairly large areas are associated with Shannon and Beechy soils and other members of its own series.

The soil has formed from mixed general alluvium that washed from upland soils derived from both loess and Coastal Plain sand and clay, but chiefly the sand. This is a flood-plain soil developed under a deciduous forest that included a high proportion of water-tolerant trees.

Profile description :

0 to 12 inches, grayish-brown or light-brown loose fine sandy loam ; 8 to 16 inches thick.

12 to 30 inches, fine sandy loam or silt loam mottled with gray, brown, or rust brown ; 10 to 40 inches thick.

30 inches +, stratified layers of sand and silt highly mottled with gray and rust brown ; 2 to 10 feet thick.

The soil is strongly to very strongly acid ; moderate to low in organic matter and plant nutrients ; and permeable when not influenced by an intermittently high water table. The water-holding capacity is high. External and internal drainage are slow. The soil is variable in sandiness but relatively free of stones or gravel.

Present use and management.—About 60 to 70 percent of Hymon fine sandy loam is cleared and used for crops or pasture. Of the cleared area, about 60 percent is in corn, 20 percent in hay, and 5 percent in cotton. The rest of the cleared area is in miscellaneous crops or idle. The Kentucky Reservoir covers a total of 11 acres. Corn is grown year after year on most of the soil. Fertilizer is seldom used, except for cotton, and the quantity applied for that crop is not adequate. Under ordinary management average acre yields are: Corn, 22 bushels ; lespedeza hay, 1.1 tons.

Use and management requirements.—The use suitability of this soil is somewhat limited by imperfect drainage and susceptibility to flooding. Nevertheless, it is well suited to corn and most hay and forage crops. Open ditches or tile should improve internal drainage and thereby broaden the use suitability. The management requirements are similar to those for Hymon silt loam.

Inman silt loam, hilly phase (12-30% slopes) (I_A).—This intensive well-drained to excessively drained shallow soil of the uplands occurs in small areas. It is associated chiefly with Maury and Talbott soils along Rushing Creek and Whites Creek east of Decaturville and in the vicinity of Martins Landing. Its parent material is resid-

uum from interbedded phosphatic limestone and shale. The soil has developed under a predominantly deciduous forest that includes some cedar.

Profile description :

- 0 to 8 inches, grayish-brown friable silt loam or heavy silt loam; 6 to 10 inches thick.
- 8 to 18 inches, yellowish-brown or brownish-yellow strongly plastic silty clay mottled with gray and yellow; numerous shale fragments, especially in the lower part.
- 18 inches +, alternate layers of shale and phosphatic limestone.

The soil is medium to strongly acid, moderate to low in organic matter, and moderate to high in plant nutrients. Although lower in phosphorus than the Maury soils, it is high in this element compared to other soils of the county. External drainage is rapid to very rapid, and internal drainage is moderately slow. Numerous shale fragments are on the surface and throughout the profile in most places. The water-holding capacity is moderately low to low.

Other soils included with this phase in mapping vary considerably. Almost half the acreage has moderately well-developed surface soil and subsoil layers and is deeper than the profile described. This inclusion is transitional between the Inman and Maury soils in most respects. Also included are areas with slopes greater than 30 percent.

Present use and management.—Practically all of the hilly phase of Inman silt loam is wooded with cedar, hickory, elm, and white, red, and post oaks. The woodland has all been cut over recently, and the stand now includes many culls. This is apparently a productive forest soil, and if the forest were properly managed trees would grow comparatively fast.

Use and management requirements.—Chiefly because of extreme susceptibility to erosion and low water-holding capacity, Inman silt loam, hilly phase, is very poorly suited to intertilled crops but fairly well suited to pasture. Suitable pasture mixtures should be sown, and the fertilizers necessary to maintain a good sod should be applied. Because the soil is extremely susceptible to erosion, a heavy sod-forming mixture should be kept on it. The supply of available phosphorus should be adequate in most places, but nitrogen and lime will be needed if good pasture is to be maintained. Possibly the nitrogen can be supplied by including legumes in the pasture mixture. Grazing should be carefully controlled because a good sod is needed at all times as a safeguard against erosion.

Inman silty clay loam, eroded hilly phase (12–30% slopes) (1b).—This eroded shallow upland soil occurs in small areas on lower ridge slopes in the Talbott-Emory-Lindside soil association, chiefly along Rushing and White Creeks and in the vicinity of Martins Landing. It has developed from interbedded phosphatic limestone and shale under a deciduous forest that included some cedar in places. The Maury and Talbott are closely associated soils.

Profile description :

- 0 to 4 inches, grayish-brown to brownish-yellow moderately friable silty clay loam; 0 to 6 inches thick.
- 4 to 14 inches, yellowish-brown or brownish-yellow strongly plastic silty clay mottled with gray and yellow; numerous shale fragments, especially in the lower part.
- 14 inches +, alternate layers of phosphatic limestone and shale.

A considerable part of the original surface layer has been eroded away. The upper part of the subsoil has been mixed with remnants of the original surface soil to form a plow layer heavier in texture and considerably more variable in color than the original surface soil. Finer particles have eroded away, leaving an accumulation of shale fragments on the surface in most places.

The soil is medium to strongly acid and low in organic matter, plant nutrients, and many fertilizing elements. It does have a comparatively large supply of phosphorus. External drainage is rapid to very rapid, and internal drainage is moderately slow. The water-holding capacity is low. Numerous shale fragments are on the surface and throughout the profile in most places.

Soils included with this one in mapping vary from it considerably in depth to bedrock and shale content. Many areas are transitional between soils of the Inman and Maury series. Also, about half of this phase has lost most of the surface layer and a part of the subsoil in places. Shallow gullies are common. These included areas do not greatly change use and management, though the deeper included soils are more productive.

Present use and management.—Most of Inman silty clay loam, eroded hilly phase, is idle land or wasteland; only a small part is used for crops and pasture. The soil is on short slopes, and fields are very small. In most places it is managed in the same way as associated Maury soils. Crop yields are very low; pasture yields are fair to good.

Use and management requirements.—Chiefly because of its extreme erodibility and low water-holding capacity, Inman silty clay loam, eroded hilly phase, is very poorly suited to intertilled crops. It is fairly well suited to pasture. Compared to most soils in the county, it is fairly high in phosphorus, but low in nitrogen and moderately low in lime. Liming will probably be necessary to obtain a pasture sod of high carrying capacity that will control accelerated erosion. Nitrogen may be needed to establish the pasture mixture, but if it includes legumes, they should supply the needed nitrogen after they are well established. Response to phosphate is fair to good on cropped areas in some places.

The slopes are short and moderately steep; consequently, control of erosion by mechanical means is not practical in many places. Ditches or terraces can be used to divert water from the slopes and aid in controlling erosion. If grazing is properly regulated, a sod that will control erosion should be fairly easy to maintain.

Lindside silt loam (0-3% slopes) (L_A).—Long narrow nearly level or slightly depressional areas of this imperfectly drained soil occur in first bottoms along the Tennessee River and many of the larger tributaries in the southeastern part of the county. It is associated chiefly with Huntington and Melvin soils of the first bottoms and Wolfvever soils of the low terraces.

The soil has formed under a cover of water-tolerant trees from mixed recent alluvium washed chiefly from upland soils underlain by limestone. In drainage and associated characteristics it is intermediate between the well-drained Huntington soils and the poorly drained Melvin soils. It is a young soil without a well-developed textural profile.

Profile description :

0 to 12 inches, brown or grayish-brown friable silt loam; 10 to 18 inches thick.

12 inches +, friable silt loam or heavy silt loam highly mottled with gray, brown, and rust brown; 2 to 10 feet thick.

The soil is medium acid, high in content of organic matter and plant nutrients, and high in water-holding capacity. It is imperfectly drained, and its highly mottled subsoil indicates that the water table is alternately high and low. External drainage is very slow, and internal drainage is slow to very slow. In most places the soil is free of gravel.

Some imperfectly drained soils along streams in the Limestone Hills section are mapped with this soil. These included soils are lighter in color and texture and contain varying quantities of chert fragments. They are similar to the Lobelville soils in adjacent counties but do not differ significantly from Lindsides silt loam in use and management requirements.

Present use and management.—Approximately 1,502 acres of Lindsides silt loam is covered by the Kentucky Reservoir, and of the rest, about 60 percent is cleared and used for crops. Use and management practices are similar to those used on the associated Huntington soils, but crops produce lower average yields and are occasionally drowned out. Most of the soil is kept in corn almost continuously, and a crop of hay or cane is grown only occasionally. Lespedeza and soybeans are the principal hay crops. Corn yields are high in favorable seasons, but low in wet ones.

Use and management requirements.—The use suitability of Lindsides silt loam is limited by imperfect drainage and susceptibility to flooding. Artificial drainage would increase average yields but would not broaden the use suitability much, because the soil cannot be protected from flooding. This soil is well suited to corn, cane, and many summer-annual hay crops. Fertilization is not generally needed, because the supply of organic matter and plant nutrients is periodically replenished by new sediments deposited by floodwaters. Under good management expectable acre yields are 5 bushels of corn, and 1.5 tons of lespedeza hay.

Lindsides silty clay loam (0-3% slopes) (L_B).—This imperfectly drained young soil of the low first bottoms consists of mixed recent alluvium washed chiefly from upland soils underlain mainly by limestone. It lies in long narrow nearly level to slightly depressed sloughlike areas. It occurs chiefly in the association with the Egam, Melvin, or Wolftever soils along the Tennessee River, or along tributary streams in association with Melvin soil. It has formed under forest consisting chiefly of water-tolerant trees. This soil is young; the differences in texture of the various layers are caused mainly by accidents of deposition.

Profile description :

0 to 12 inches, dark grayish-brown to brown moderately friable silty clay loam; 10 to 18 inches thick.

12 to 22 inches, brownish-gray moderately friable silty clay loam splotched with gray and rust brown; 6 to 14 inches thick.

22 inches +, slightly compact silty clay loam highly mottled with gray, rust brown, and yellow; 2 to 10 feet thick.

The soil is medium acid, high in water-holding capacity, and high in content of organic matter and plant nutrients. It is imperfectly drained; the water table is alternately high and low. External drainage is very slow; internal drainage is slow to very slow. The soil is free of gravel in most places.

Included with this soil in mapping is a small acreage along tributary streams in the southeastern part of the county. This inclusion consists of local alluvium washed chiefly from stony land; it is heavier textured and more strongly plastic than the soil described.

Present use and management.—An estimated 70 percent of Lindsides clay loam is cleared and cropped. Corn is the main crop, but some lespedeza, soybeans, and cane are grown. About 15 to 20 percent of the cleared land is left idle each year. When the distribution of rainfall is favorable, crops make high yields, but in wet seasons yields are generally low or sometimes crops are a complete failure. Approximately 129 acres of this soil are covered by Kentucky Reservoir.

Use and management requirements.—The soil is fairly well suited to corn, annual hay, and some other feed and forage crops. Imperfect drainage and susceptibility to flooding limit its suitability for many crops. Artificial drainage should increase yields but would not significantly broaden use suitability. The soil has poor tilth. It puddles if plowed wet and becomes hard and cloddy upon drying. It will also clod badly if plowed when too dry. The moisture range over which it can be tilled is narrow. Management will be concerned chiefly with selection of adapted varieties of crops and more timely and better tillage. Fertilization is not considered necessary in many places. The expected acre yield of corn under good management is 50 bushels.

Maury silt loam, rolling phase (5–12% slopes) (M_A).—Lower ridge slopes and terracelike positions in the limestone valleys are occupied by this well-drained upland soil. The largest areas are near Martins Landing in the southern part of the county. The soil is associated with Inman and Talbott soils of the uplands, Emory soil of the colluvial lands, and Huntington and Lindsides soils of the bottom lands. The parent material is highly phosphatic residuum from phosphatic limestone. In some places the parent rock includes thin beds of shale. The soil has developed under a deciduous forest.

Profile description:

- 0 to 10 inches, brown friable silt loam; upper 2 or 3 inches is dark grayish brown and stained with organic matter; 8 to 12 inches thick.
- 10 to 36 inches, reddish-brown moderately plastic heavy silty clay loam or silty clay; 20 to 30 inches thick.
- 36 inches +, yellowish-brown strongly plastic silty clay spotted with yellow and gray; bedrock at depth of 5 to 10 feet.

The soil is medium acid, comparatively high in organic matter and plant nutrients, and exceptionally high in phosphorus. Internal and external drainage are moderate. The soil is permeable to air, roots, and water and high in water-holding capacity. Bedrock outcrops are common in places, but the soil is relatively free of stones and gravel. Numerous small concretions are in the subsoil and substratum.

Included with this phase are small areas that have developed from materials influenced by shale. These included soils are lighter

colored, heavier textured, and lower in phosphorus than the soil described. Some areas have apparently received a small deposit of wind-blown silt. The surface soil of these inclusions is lighter in color and texture, and the upper part of the subsoil is yellowish brown to brown rather than the reddish-brown. Some areas having 2- to 5-percent slopes are also included. None of these inclusions differs significantly from the soil described in the use and management required.

Present use and management.—Practically all of Maury silt loam, rolling phase, is wooded with hickory, white and red oaks, redgum, elm, redbud, and cedar. The woodland has been cut over and does not include much marketable timber. The timber grows relatively fast in comparison to that on other upland soils.

Use and management requirements.—This soil is physically well suited to crops or pasture, but its small areas are in most places associated with soils not suited to such use. It would not be practicable to clear and cultivate many areas. The soil is high in plant nutrients, organic matter, and water-holding capacity; consequently, it is highly productive of most crops. If cleared, it should be used and managed like Maury silty clay loam, eroded rolling phase.

Maury silty clay loam, eroded rolling phase (5-12% slopes) (MB).—This well-drained upland soil occurs on lower ridge slopes in limestone valleys. Most of the acreage is east of Decaturville along Rushing Creek and in the vicinity of Martins Landing. The soil is closely associated with Inman and Talbott soils. It has developed from phosphatic limestone residuum, which is influenced in some places by thin beds of shale in the parent rock. The soil has developed under a deciduous forest.

Profile description :

- 0 to 6 inches, brown to reddish-brown friable silty clay loam; 0 to 10 inches thick.
- 6 to 32 inches, reddish-brown moderately plastic heavy silty clay loam or silty clay; 20 to 30 inches thick.
- 32 inches +, yellowish-brown strongly plastic silty clay spotted with yellow and gray; bedrock at a depth of 5 to 10 feet.

The soil is medium to strongly acid and moderately high in plant nutrients, especially phosphorus. Internal and external drainage are moderate. The soil is permeable to air, roots, and water and high in water-holding capacity. Bedrock outcrops are fairly common, but in general the soil is relatively free of stones or gravel. Numerous small concretions are in the subsoil and substratum.

A considerable part of the original surface soil has been lost through erosion. In most places the present surface layer consists of remnants of the original surface layer mixed with the upper part of the subsoil. The mixing has made the present surface layer heavier textured than the original, and variable in color and texture. Small severely eroded spots are common; these are conspicuous because the subsoil has been exposed.

About one-third of this phase consists of a soil developed from the residuum from interbedded phosphatic limestone and shale. The surface soil of this inclusion is grayish-brown to brownish-yellow, and the subsoil is yellowish-brown. This inclusion is lower in organic

matter and plant nutrients than the soil described, but it does not differ greatly in management requirements.

Present use and management.—All of Maury silty clay loam, eroded rolling phase, has been cleared and used for crop or pasture. About 30 percent is used for corn, 15 percent for cotton, 25 percent for hay and pasture, and 20 percent for miscellaneous crops. Approximately 10 percent is idle land or wasteland. Crops are not systematically rotated, though a variety of crops are grown. Fertilizers are rarely if ever used. A few farmers have attempted to control erosion with terraces or diversion ditches. Under ordinary management practices expectable acre yields are 30 bushels of corn, 320 pounds of cotton, and 1.2 tons of lespedeza hay.

Use and management requirements.—The eroded rolling phase of Maury silty clay loam is well suited to most crops commonly grown in the county. Tillage is less satisfactory, fertility is lower, and moisture supplies for plants are considerably less in this phase than in the rolling phase of Maury silt loam. Even so, it is one of the most productive soils of the uplands. Its management should be concerned chiefly with supplying needed elements and preventing further erosion. Nitrogen is apparently the element most needed for high crop yields; it can be supplied by using a legume crop in the rotation. The soil is well suited to deep-rooted legumes such as alfalfa or sweet-clover, but liming is necessary for good yields. Phosphate should not be needed for any crop, but potash may be required for the deep-rooted legumes and the crops following.

The soil is susceptible to erosion but probably can be maintained with a rotation that includes a row crop only once in 4 years. Terraces and other mechanical means of erosion control should be effective in checking runoff and erosion. The slopes are generally too short for strip cropping. Under good management expectable yields are 45 bushels of corn, 480 pounds of cotton, and 1.8 tons of lespedeza hay.

Maury silty clay loam, severely eroded rolling phase (5–12% slopes) (Md).—This is a severely eroded well-drained phosphatic upland soil occurring in foot-slope or terracelike positions in the limestone valleys. It is closely associated with Talbott and Inman soils and with other Maury soils. It has developed from phosphatic limestone residuum that includes some shale in places.

Profile description:

- 0 to 4 inches, brown to reddish-brown moderately friable silty clay loam; 0 to 6 inches thick.
- 4 to 30 inches, reddish-brown moderately plastic heavy silty clay spotted with yellow and gray.
- 30 inches +, yellowish-brown strongly plastic silty clay spotted with yellow and gray; at a depth of 5 to 10 feet, bedrock.

This soil is severely eroded; most of the original surface soil and a part of the subsoil have been lost in some places. Shallow gullies are common. The present surface layer consists largely of subsoil material and a small admixture of original surface soil. The color and texture are variable, but in most places the texture is a silty clay loam.

The medium-acid to strongly acid soil is moderately low in organic matter and some plant nutrients. It has a relatively high content of phosphorus. External drainage is moderate to rapid, and internal drainage is moderate. The water-holding capacity is moderate. Bed-

rock outcrops are fairly common, but the soil is relatively free of stones and gravel. Numerous small concretions occur in the subsoil and substratum.

Mapped with this phase are some small areas that have lost practically all their surface soil and subsoil. Also included are some small areas derived from the residuum of interbedded phosphatic limestone and shale. These included soils are shallow, and outcrops of bedrock are common. Their total area is very small.

Present use and management.—All of Maury silty clay loam, severely eroded rolling phase, is cleared and has been used intensively for crops. At present, however, about 50 percent of it lies idle or is abandoned. An estimated 30 percent is used for hay or pasture, 5 percent for corn, 5 percent for cotton, and 10 percent for miscellaneous crops. The present severely eroded condition indicates that use and management practices were poorly adjusted to the soil. Crops are not systematically rotated, and fertilizers are not commonly used. Under ordinary management average yields are 18 bushels of corn, 220 pounds of cotton, and 0.7 ton of lespedeza hay.

Use and management requirements.—This soil has been severely damaged by erosion; much of the organic matter and a part of the available plant nutrients have been lost, and tilth and water-holding capacity have been greatly impaired. The heavier textured surface layer now exposed absorbs less rainfall; consequently, runoff is greater, more erosion takes place, and less moisture is available for growing plants.

A long rotation consisting chiefly of grasses, legumes, and close-growing crops is needed to bring this soil back into production. Alfalfa, sericea, sweetclover, and other deep-rooted legumes can be established and maintained if the soil is properly limed. Potash may be necessary on some areas, but need for it will depend largely on how the soil has been cropped. The legume crop should supply nitrogen for the crops following it, but some nitrogen fertilizer may be needed to establish the legume. Barnyard manure is an excellent source of nitrogen and organic matter, and if enough of it is available, may partly take the place of a legume crop in the rotation.

Terracing or other measures probably will be needed to aid in controlling runoff and erosion. All tillage should be on the contour. Under good management expectable acre yields are 35 bushels of corn, 420 pounds of cotton, and 1.4 tons of lespedeza hay.

Maury silty clay loam, eroded undulating phase (2–5% slopes) (Mc).—Small areas of this highly productive well-drained soil occur near Martins Landing, in the Clifton Bend area near Clifton in Wayne County, and along Rushing Creek southeast of Decaturville. The soil is closely associated with the Inman and Talbott soils. It has developed from phosphatic limestone residuum that includes some shale in places. The surface soil may be influenced in places by a very thin deposit of loess. The native vegetation consisted of deciduous trees.

Profile description:

- 0 to 6 inches, brown to reddish-brown friable silty clay loam; 0 to 10 inches thick.
- 6 to 36 inches, reddish-brown moderately friable heavy silty clay loam or silty clay; 20 to 40 inches thick.
- 36 inches +, yellowish-brown strongly plastic silty clay spotted with yellow and gray; at a depth of 5 to 10 feet, bedrock.

Erosion has removed a considerable part of the original surface layer. In most places the present surface layer consists of remnants of the original surface layer mixed with the upper part of the subsoil. Mixing has made the present surface layer heavier textured and more variable in color and texture than the original. Small severely eroded spots exposing the subsoil are common and conspicuous.

The soil is medium to strongly acid and moderate to high in plant nutrients, especially in phosphorus. It is moderately low in organic matter and nitrogen; permeable to air, roots, and water; and high in water-holding capacity. Drainage, both internal and external, is moderate. The soil is relatively free of stones and gravel. Small concretions are common in the subsoil and substratum.

Present use and management.—All of Maury silty clay loam, eroded undulating phase, is cleared and has been used for crops and pasture. About 30 percent is used for corn, 20 percent for cotton, 30 percent for hay and pasture, and 10 percent for miscellaneous crops; 10 percent is idle. Crops are not selected on the basis of a rotation that will maintain or improve the soil; the immediate needs of the farmer determine the choice. Fertilizers are seldom used. Under ordinary management corn yields 35 bushels; cotton, 340 pounds; and lespedeza hay, 1.5 tons.

Use and management requirements.—This soil is similar to the eroded rolling phase of Maury silty clay loam in use suitability and many management requirements. Runoff and erosion are not so serious a problem, however, and therefore this soil can be maintained under a shorter rotation. Row crops can be grown at frequent intervals if followed by cover crops. Mechanical means of erosion control should not be necessary if other management practices are good. Nevertheless, all tillage should be on the contour if at all feasible.

The supplies of phosphate and potash in the soil are apparently adequate for the successful growth of most crops, but in most areas the nitrogen supply has been seriously depleted by continuous cropping and erosion. This deficiency can be corrected by including legumes, preferably deep-rooted ones, in the rotation. Under good management expectable acre yields are 55 bushels of corn, 500 pounds of cotton, and 2.4 tons of red clover hay.

Melvin silt loam (0-3% slopes) (ME).—The long narrow depressional or sloughlike areas of this bottom land soil occur on the Tennessee River flood plain or along tributary streams in the southeastern part of the county. They are associated with areas of Lindside, Egam, Huntington, Wolftever, and Sequatchie soils. Parent material from limestone predominates, but a small acreage along larger streams in the Limestone Hills section associated with Ennis soils has been formed from highly mixed general alluvium. This alluvium washed from upland soils underlain by a wide variety of rocks. The native vegetation consists largely of willow, willow oak, tupelo gum, cypress, and other water-tolerant trees.

Profile description:

- 0 to 6 inches, brownish-gray or gray friable silt loam or light silty clay loam spotted with light gray and rust brown; 4 to 8 inches thick.
- 6 to 8 inches, friable silt loam to silty clay loam highly mottled with gray, yellow, and rust brown; 10 to 20 inches thick.
- 18 inches +, bluish-gray silty clay loam; 2 to 10 feet thick.

The soil is medium to strongly acid and high in organic matter, plant nutrients, and water-holding capacity. It is permeable, but is waterlogged during rainy seasons when the water table is high. It is free of gravel or stone in most places.

A small acreage included with this soil in mapping has formed from alluvium washed chiefly from soils underlain by cherty limestone. This included soil is lighter textured and more acid than the soil described and it contains chert fragments throughout the profile in most places. Use and management requirements of the included soil do not differ significantly from those of the soil described.

Present use and management.—Most of Melvin silt loam is still wooded, but a part is cleared and used for crops and pasture. Of the aggregate area, 892 acres are covered by Kentucky Reservoir. Some of the cleared acreage is used and managed like the associated Lindsides and Huntington soils, but most of it is too poorly drained to be cultivated at the same time as those soils. This soil is used chiefly for wild hay, late corn, or sorghum. Crop production is very uncertain, and failures are common.

Use and management requirements.—With its present drainage, Melvin silt loam is not suitable for tilled crops but fairly well suited to pasture. If the soil were drained, it should become moderately to highly productive of corn, sorghum, and some hay crops. Its suitability would still be limited by susceptibility to flooding. The soil should drain well because it is permeable throughout; the feasibility of draining it rests upon several factors, the actual response to drainage being but one. As it is now, the soil is fairly productive of low-quality pasture. Seeding of better mixtures and fertilization are needed to produce better pastures.

Paden silt loam, undulating phase (2-5% slopes) (Pd).—This moderately well drained siltpan soil occurs on high terraces along the Tennessee River, chiefly in the southern part of the county in association with Pickwick, Taft, and Robertsville soils. In some places the soil is composed of old general stream alluvium, a mixture of materials washed from upland soil underlain by a wide variety of rocks, including limestone. In most places a thin layer of loess covers the old alluvium, and the parent material consists of varying mixtures of the two. The soil has developed under a deciduous forest.

Profile description:

- 0 to 8 inches, yellowish-gray to grayish-yellow mellow silt loam; 6 to 10 inches thick.
- 8 to 24 inches, yellowish-brown to brownish-yellow friable silty clay loam; 16 to 22 inches thick.
- 24 to 42 inches, (siltpan) compact silt loam to silty clay loam mottled with gray, yellow, and brown; 16 to 20 inches thick.
- 42 inches +, moderately friable silty clay loam mottled red, brown, yellow, and gray; 2 to 10 feet thick.

The soil is very strongly acid, low in organic matter and plant nutrients, and low in water-holding capacity. The surface soil and subsoil are permeable to air, roots, and water, but the siltpan is only slightly permeable. External drainage is moderate; internal drainage is moderately slow. The upper soil layers are free of gravel, but the layer below the siltpan is gravelly in places.

Included with the phase is a significant acreage of slightly eroded soil not greatly different in the use and management it requires.

Present use and management.—Most of the undulating phase of Paden silt loam is in forests consisting chiefly of oaks. The cleared areas are used for crops and pasture. Corn, cotton, peanuts, and lespedeza—the principal crops—are not grown in any systematic rotation, nor are they adequately fertilized. The forests have been cut over; the present stand is small and includes many culls.

Use and management requirements.—This soil is physically well suited to most common field crops but is only moderately productive, chiefly because it has low fertility and water-holding capacity. Its use suitability is somewhat limited by slow internal drainage. To maintain or increase productivity, crop rotation and adequate fertilization will be required. The rotation can be fairly short but should include a legume crop or a legume-grass mixture. A cover crop, preferably a legume, should follow all intertilled crops. Lime, phosphate, and possibly potash are necessary for the legume crop, especially if it is a deep-rooted one. Nitrogen is needed for all except the legume crop and the crop immediately following. A complete fertilizer is needed for the cotton and grain crops.

Owing to the low water-holding capacity of the soil, summer crops are often injured by droughts. Small grains give proportionally higher yields, mainly because they mature during the season of higher rainfall. Under good management expectable acre yields are 43 bushels of corn, 440 pounds of cotton, and 1.5 tons of lespedeza.

Paden silt loam, eroded undulating phase (2–5% slopes) (P_B).—This moderately well-drained siltpan soil occurs on old high terraces, chiefly along the Tennessee River in the southern part of the county. It is closely associated with Pickwick, Taft, and Robertsville soils. Its parent material consists mainly of wind-blown silt in which there are varying quantities of mixed alluvium. The soil has developed under a deciduous forest.

Profile description :

- 0 to 6 inches, yellowish-gray to grayish-yellow mellow silt loam; 0 to 8 inches thick.
- 6 to 22 inches, yellowish-brown to brownish-yellow friable silty clay loam; 16 to 22 inches thick.
- 22 to 40 inches (siltpan) compact silt loam to silty clay loam mottled with gray, yellow, and brown; 16 to 20 inches thick.
- 40 inches +, moderately friable silty clay loam mottled with red, brown, yellow, and gray; 2 to 10 feet thick.

A considerable part of the original surface soil has been lost as a result of erosion. Some subsoil has been mixed into the plow layer, but the original surface soil constitutes the plow layer in most areas. A few severely eroded spots are conspicuous because the subsoil is exposed.

The soil is very strongly acid and low in organic matter, plant nutrients, and water-holding capacity. The surface soil and subsoil are permeable to air, roots, and water; the siltpan is only slightly permeable. External drainage is moderate, but internal drainage is moderately slow. The material below the siltpan contains considerable gravel in some places.

Present use and management.—All of this phase has been cleared and used for crops and pasture. About 15 percent is used for cotton, 20 percent for corn, 20 percent for miscellaneous crops, and 20 percent

for hay and pasture. Some 25 percent lies idle. Crops are not rotated systematically. Some fertilizer is used on cotton but fertilization is not a common practice. Under present management corn yields 18 bushels; cotton, 240 pounds; and lespedeza hay, 0.8 ton.

Use and management requirements.—Paden silt loam, eroded, undulating phase, is physically suited to most crops commonly grown in the county but its naturally low productivity has been further reduced by continuous cropping and erosion. To maintain or increase yields the farmer will probably have to rotate his crops and apply adequate quantities of fertilizer. The rotation can be short but should include a legume or legume-grass mixture. A deep-rooted legume such as alfalfa and red clover is preferred but difficult to establish and maintain. A cover crop, preferably a legume such as vetch or crimson clover, should follow all intertilled crops. Lime, phosphate, and possibly potash are necessary for the legume crop. All except the legume and the crop immediately following require nitrogen. A good response may be expected from the use of a complete fertilizer for cotton and small grains. Special measures should not be necessary for erosion control, but all tillage should be on the contour if feasible. Under good management practices, expectable acre yields are 40 bushels of corn, 400 pounds of cotton, and 1.4 tons of lespedeza.

Paden silt loam, rolling phase (5-12% slopes) (Po).—This moderately well drained siltpan soil occurs on old high Tennessee River terraces, chiefly in the southern part of the county in the Pickwick-Paden-Etowah soil association. It is closely associated with Pickwick and Etowah soils. It differs from Paden silt loam, undulating phase, chiefly in having stronger slopes. The parent material consists of loesslike silt underlain by limestone or varying mixtures of the two. The soil has developed under deciduous forest.

Profile description :

- 0 to 8 inches, yellowish-gray to grayish-yellow mellow silt loam; 6 to 10 inches thick.
- 8 to 24 inches, yellowish-brown to brownish-yellow friable silty clay loam; 16 to 22 inches thick.
- 24 to 40 inches (siltpan) compact silt loam to silty clay loam mottled with gray, yellow, and brown; 14 to 18 inches thick.
- 40 inches +, moderately friable silty clay loam mottled with red, yellow, and gray; 2 to 10 feet thick.

This soil is very strongly acid and low in organic matter, plant nutrients, and water-holding capacity. The surface soil and subsoil are permeable to air, roots, and water, but the siltpan is only slightly permeable. External drainage is moderate; internal drainage is moderately slow. The surface soil and subsoil are free of gravel.

Present use and management.—Practically all of the rolling phase of Paden silt loam is in forest consisting largely of white, red, post, and blackjack oaks and hickory. The forests have been cut over, so the stand is now small and includes many culls. The trees grow slowly.

Use and management requirements.—Chiefly because of its stronger slopes, this soil is inferior to Paden silt loam, undulating phase, for crops. If cleared of forest it is very susceptible to accelerated erosion. The rotation will need to be long and include close-growing crops. Cultivation should be on the contour, and contour strip cropping is advisable on the longer slopes. Terraces may be necessary to aid in

checking runoff. Use and management practices should be fairly similar to those for Paden silt loam, eroded rolling phase.

Paden silt loam, eroded rolling phase (5–12% slopes) (P_A).—The small areas of this moderately well drained soil occur on high terraces along the Tennessee River in association with Pickwick, Taft, and Robertsville soils of terrace lands and Lindside and Melvin soils of bottom lands. The largest acreages are in the southern part of the county. The parent material consists of varying mixtures of loess and old alluvium. The alluvium washed from upland soil underlain by a variety of rocks, including limestone. The soil has developed under deciduous forest.

Profile description :

0 to 6 inches, grayish-yellow mellow silt loam ; 0 to 8 inches thick.

6 to 22 inches, yellowish-brown to brownish-yellow friable silty clay loam ; 16 to 22 inches thick.

22 to 38 inches (siltpan) compact silt loam to silty clay loam mottled with gray, yellow, and brown ; 14 to 20 inches thick.

38 inches +, moderately friable silty clay loam mottled red, brown, yellow, and gray ; 2 to 10 feet thick.

A substantial part of the original surface soil has been lost as a result of erosion. Some of the subsoil has been mixed with remnants of the original surface soil in the plow layer, but the original surface soil constitutes the plow layer over most of the areas. A few severely eroded spots are conspicuous because the subsoil is exposed.

The soil is very strongly acid and low in organic matter, plant nutrients, and water-holding capacity. The surface soil and subsoil are permeable to air, roots, and water, but the siltpan is only slightly permeable. External drainage is moderate; internal drainage, moderately slow.

Present use and management.—Practically all of Paden silt loam, eroded rolling phase, has been cleared and cropped. An estimated 15 percent is used for corn, 15 percent for cotton, 25 percent for hay and pasture, and 10 percent for miscellaneous crops. About 35 percent lies idle. Crops are not rotated systematically, nor is fertilization commonly practiced. Under common management corn yields 16 bushels; cotton, 220 pounds; and lespedeza hay, 0.7 ton an acre.

Use and management requirements.—Paden silt loam, eroded rolling phase, is physically suited to most of the crops grown in the county but its naturally low productivity has been further reduced by continuous cropping and erosion. Management is concerned chiefly with increasing productivity and controlling erosion. A long rotation consisting chiefly of close-growing crops and including legumes is desirable. The soil is low in lime, phosphate, nitrogen, and potash; applications of these will be needed for high yields of most crops. A legume crop in the rotation will add valuable nitrogen and organic matter. A winter cover crop, preferably a legume, should follow all intertilled crops.

Row crops should be planted on the contour. Terraces will probably be an effective aid in controlling runoff and erosion if they are used with other good management practices. Under good management expectable acre yields are 38 bushels of corn, 380 pounds of cotton, and 1.2 tons of lespedeza hay.

Paden silty clay loam, severely eroded rolling phase (5-12% slopes) (P_E).—This severely eroded moderately well drained siltpan soil occurs on old high Tennessee River terraces, chiefly in the southern part of the county. It is closely associated with Pickwick, Etowah, Taft, and Robertsville soils. The parent material consists of a loess-like silt underlain by highly mixed alluvium or varying mixtures of the silt and alluvium. The old alluvium came chiefly from soils underlain by limestone.

Profile description :

- 0 to 4 inches, grayish-yellow to brownish-yellow friable silty clay loam; 0 to 6 inches thick.
- 4 to 20 inches, yellowish-brown to brownish-yellow friable silty clay loam; 16 to 22 inches thick.
- 20 to 36 inches (siltpan) compact silt loam to silty clay loam mottled with gray, yellow, and brown; 14 to 20 inches thick.
- 36 inches +, moderately friable silty clay loam mottled red, brown, yellow, and gray; 2 to 10 feet thick.

Most of the original surface soil and a part of the subsoil have been eroded away. Shallow gullies are numerous, but a considerable part of the original surface layer remains in the intergully areas. Over much of the area the subsoil has been mixed with the plow layer to form a present surface layer heavier textured than the original surface soil.

The soil is very strongly acid and low in organic matter, plant nutrients, and water-holding capacity. The surface soil and subsoil are permeable to air, roots, and water, but the siltpan is only slightly permeable. External drainage is moderate to rapid, but internal drainage is moderately slow.

Present use and management.—All of Paden silty clay loam, severely eroded rolling phase, has been cleared and used for crops or pasture, but most of it is now either left idle or used as unimproved pasture. A small part is cropped. Yields from crops and pastures are extremely low. A few farmers have tried to check erosion with terraces, but not many of these attempts have been accompanied by an improved cropping system or fertilization.

Use and management requirements.—In its present condition this soil is unsuitable for tilled crops and poorly suitable for pasture. It is difficult to reforest, and the forest cover reestablishes itself very slowly under natural conditions. In its present state the soil probably is best used for pasture, but fertilization and liming will be required to obtain even a fair stand. Phosphate, potash, and probably nitrogen will be needed to establish a sod. The soil should be seeded to heavy sod-forming pasture mixtures that include legumes. Grazing must be carefully regulated if a good sod is to be maintained at all times. Possibly, after a few years in well-managed pasture, the soil will be suited to crops. If so, the management requirements would be similar to those for Paden silt loam, eroded rolling phase.

Pickwick silt loam, rolling phase (5-12% slopes) (P_L).—Parts of old high Tennessee River terraces, chiefly those in the Pickwick-Paden-Etowah soil association in the southern part of the county, are occupied by this well-drained soil. Closely associated with it are Paden and Etowah soils and other Pickwick soils. The parent material consists of loess or loesslike silt underlain by old alluvium or a

mixture of loess material and alluvium. The alluvium washed partly from soils underlain by limestone. The soil has developed under deciduous forest.

Profile description:

- 0 to 10 inches, grayish-brown or brownish-gray mellow silt loam; 8 to 12 inches thick.
- 10 to 32 inches, reddish-brown or yellowish-brown friable silty clay loam; 18 to 24 inches thick.
- 32 inches +, reddish-brown to brownish-red moderately friable silty clay loam spotted with gray and yellow; 2 to 10 feet or more thick.

The soil is moderately high in organic matter, plant nutrients, and water-holding capacity. It is medium to strongly acid and readily permeable to air, roots, and water. Internal and external drainage are moderate. Relatively little gravel occurs in the surface soil and subsoil, but in places the substratum has a considerable amount.

Present use and management.—Practically all of Pickwick silt loam, rolling phase, is in forest consisting chiefly of white and red oaks and hickory. The forest has been cut over; the present stand is small and includes many culls. The trees grow fairly rapidly.

Use and management requirements.—This soil is physically well suited to deep-rooted legumes and other crops commonly grown in the county. It is a deep permeable soil, high in water-holding capacity and moderately high in plant nutrients. Good moisture relations and moderately high fertility make it naturally productive and very responsive to good management. The cleared soil is susceptible to erosion. Management should be concerned with preventing the loss of soil material and maintaining or increasing the supply of available plant nutrients. Use and management practices for this soil should be similar to those for Pickwick silt loam, eroded rolling phase.

Pickwick silt loam, eroded rolling phase (5–12% slopes) (Pg).—This well-drained soil occurs on old high Tennessee River terraces, where it is associated with Etowah, Paden, Taft, and Robertsville soils. It is largely confined to the Pickwick-Paden-Etowah soil association. The parent material consists of loess or loesslike silt underlain by highly mixed old alluvium or varying mixtures of loess material and alluvium. The old alluvium came partly from soils underlain by limestone.

Profile description:

- 0 to 6 inches, grayish-brown to yellowish-brown mellow silt loam; 0 to 8 inches thick.
- 6 to 30 inches, light reddish-brown or yellowish-brown friable silty clay loam; 18 to 24 inches thick.
- 30 inches +, reddish-brown to brownish-red moderately friable silty clay loam spotted with gray and yellow; 2 to 10 feet or more thick.

A considerable part of the original surface layer has been lost as a result of erosion. Remnants of the original surface soil have been mixed with the subsoil during plowing to form a present surface layer highly variable in both color and texture. Small severely eroded spots exposing the subsoil are common and conspicuous. The texture of the more eroded parts is a silty clay loam.

The soil is strongly acid, moderate in organic-matter content, moderately high in plant nutrients, and high in water-holding ca-

capacity. It is permeable to air, roots, and water. Internal and external drainage are moderate. The surface soil and subsoil layers are free of gravel, but the substratum is gravelly in some places.

Present use and management.—All areas of Pickwick silt loam, eroded rolling phase, are cleared and have been used for crops. An estimated 20 percent is now used for cotton, 20 percent for corn, 10 percent for miscellaneous crops, and 20 percent for hay or pasture. The remaining 30 percent is idle land or wasteland. A variety of crops are grown, but the immediate needs of the farmer, not the needs of the soil, usually determine which one. Cotton is fertilized with about 200 pounds an acre of a fertilizer such as 3-9-6 or 4-12-4 or with a low-analysis fertilizer. Some lime and phosphate have been used on hay crops recently. Under ordinary management, average acre yields are 22 bushels of corn, 280 pounds of cotton, and 1 ton of lespedeza hay.

Use and management requirements.—The eroded rolling phase of Pickwick silt loam is physically well suited to all common field crops grown in the county. Nevertheless, it has impaired tilth, lower fertility, and less water-holding capacity than the rolling phase of Pickwick silt loam. It responds very well to good management, however, and if it is properly managed, greatly increases in productivity. A rotation of moderate length that includes a deep-rooted legume is a desirable part of any program of improved management. In most places lime and phosphate are essential for successfully growing alfalfa, sweetclover, or other deep-rooted legumes. All crops need phosphate for high yields; potash may or may not be needed, depending on the crops grown. The legume should supply enough nitrogen for other crops if a moderately short rotation is used.

Terraces should be an effective aid in controlling erosion. They probably will be needed unless the soil is used for close-growing crops most of the time. Wherever possible the fields should be tilled on the contour. Under good management expectable acre yields are 45 bushels of corn, 420 pounds of cotton, and 1.6 tons of lespedeza hay.

Pickwick silt loam, undulating phase (2-5% slopes) (Pm).—This smooth well-drained soil occurs chiefly on old high Tennessee River terraces in the Pickwick-Paden-Etowah soil association. Paden, Etowah, Taft, and Robertsville soils are closely associated with it. The parent material is loess or loesslike silt underlain by old mixed alluvium or the first-mentioned materials in various mixtures with the alluvium. The mixed alluvium came partly from soils underlain by limestone.

Profile description :

- 0 to 10 inches, grayish-brown or brownish-gray mellow silt loam; 8 to 12 inches thick.
- 10 to 36 inches, reddish-brown or yellowish-brown friable silty clay loam; 20 to 30 inches thick.
- 36 inches +, reddish-brown to brownish-red moderately friable silty clay loam spotted with gray and yellow; 2 to 10 feet or more thick.

The soil is moderately high in organic matter and plant nutrients and high in water-holding capacity. It is medium to strongly acid. Internal and external drainage are moderate. The surface soil and subsoil are relatively free of gravel.

Present use and management.—About 70 percent of the undulating phase of Pickwick silt loam has been cleared and is now cropped. The rest is wooded with red and white oaks and hickory. The cleared land is chiefly in cotton, though some corn and miscellaneous crops are grown. The cotton generally receives light applications of fertilizer; some lime and phosphate are used on the hay crop. The crops are not systematically rotated. Under ordinary management average acre yields are 30 bushels of corn, 360 pounds of cotton, and 1.2 tons of lespedeza hay.

Use and management requirements.—This soil is well suited to all the common field crops grown in the county, including the deep-rooted legumes. Its lime and fertilizer requirements are similar to those of Pickwick silt loam, eroded rolling phase, but the crop rotation presumably can be shorter and include more intertilled crops. Mechanical means of runoff control should not be needed, but tillage should be on the contour where possible. Under good management expectable acre yields are 55 bushels of corn, 520 pounds of cotton, and 1.8 tons of lespedeza hay.

Pickwick silt loam, eroded undulating phase (2-5% slopes) (P_H).—This well-drained soil is closely associated with Etowah, Paden, Taft, and Robertsville soils on old high terraces of the Tennessee River. It is confined largely to the Pickwick-Paden-Etowah soil association and is derived from loess or loesslike silt underlain by old mixed alluvium or from the first-mentioned materials mixed with the alluvium.

Profile description :

- 0 to 6 inches, grayish-brown to yellowish-brown mellow silt loam; 0 to 8 inches thick.
- 6 to 32 inches, reddish-brown or yellowish-brown friable silty clay loam; 20 to 30 inches thick.
- 32 inches +, reddish-brown to brownish-red moderately friable silty clay loam spotted with gray and yellow; 2 to 10 feet or more thick.

Erosion has removed a considerable part of the original surface layer. Small severely eroded spots are common, and conspicuous because the subsoil is exposed. The surface soil has been mixed with the subsoil, but its texture has been changed significantly only in the more severely eroded spots. A very small acreage of severely eroded soil is included with this phase.

This soil is moderate in content of organic matter and moderately high in plant nutrients and water-holding capacity. It is strongly acid. Internal and external drainage are moderate. The surface soil and subsoil are relatively free of gravel.

Present use and management.—All of Pickwick silt loam, eroded undulating phase, is cleared and used for crops. An estimated 15 percent is used for cotton, 20 percent for corn, 15 percent for miscellaneous crops, and 25 percent for hay and pasture. The rest is left idle. Crops are not systematically rotated, nor is fertilization commonly practiced except for the cash crops. Under common management yields are 25 bushels of corn, 320 pounds of cotton, and 1.2 tons of lespedeza hay an acre.

Use and management practices.—Where fields are properly fertilized, this soil produces relatively high yields of all common field crops, including deep-rooted legumes. The soil is moderately well

supplied with plant nutrients, but for continued high yields fertilization is necessary. The use and management requirements are similar to those of Pickwick silt loam, eroded rolling phase, but the rotation presumably can be shorter and include more intertilled crops. Mechanical means of erosion control should not be necessary. Under good management expectable acre yields are 50 bushels of corn, 480 pounds of cotton, and 1.8 tons of lespedeza hay.

Pickwick silt loam, hilly phase (12–30% slopes) (P_K).—This well-drained soil occurs on the stronger slopes of more highly dissected old high Tennessee River terraces. It is closely associated with Etowah and Paden soils and is largely confined to the Pickwick-Paden-Etowah soil association. It differs from the rolling phase of Pickwick silt loam chiefly in having stronger slopes. It is derived from loess or loesslike silt underlain by old alluvium or from various mixtures of loessal material and alluvium. The native vegetation consists chiefly of white and red oaks and hickory.

Profile description:

- 0 to 10 inches, grayish-brown or brownish-gray mellow silt loam; 8 to 12 inches thick.
- 10 to 30 inches, reddish-brown or yellowish-brown friable silty clay loam; 12 to 24 inches thick.
- 30 inches +, reddish-brown to brownish-red moderately friable silty clay loam to gravelly clay loam spotted with gray and yellow; 2 to 10 feet or more thick.

This soil has a moderately high content of organic matter and plant nutrients. It has a moderately high water-holding capacity and is very permeable to air, roots, and water. External drainage is rapid, and internal drainage is moderate to rapid. The surface soil and subsoil are free of gravel, but the substratum is relatively gravelly in some places.

This soil varies in many characteristics, including the degree to which the textural profile has developed. Some small areas of soils similar to Etowah gravelly silt loam, hilly phase, are included with it.

Present use and management.—Practically all of Pickwick silt loam, hilly phase, is in forest consisting principally of red and white oaks and hickory. Most of the forest has been cut over. The timber grows relatively fast, but the present stand is small and includes many culls.

Use and management requirements.—This soil is naturally moderately productive but its strong slopes make it poorly suited to tilled crops. Runoff is difficult to control, and under clean cultivation the soil is highly susceptible to erosion. If it is to be cropped, a long rotation consisting chiefly of close-growing crops should be used if at all feasible. The fertilizer requirements are similar to those of Pickwick silt loam, eroded rolling phase. The soil is probably best used for pasture. A good sod-forming pasture mixture, planted on the limed and phosphated soil, should control erosion if properly grazed, and in addition produce a fairly high yield of pasture.

Pickwick silt loam, eroded hilly phase (12–30% slopes) (P_r).—Areas of this well-drained soil are closely associated with areas of Etowah and Paden soils on high terraces of the Tennessee River. The soil is in the Pickwick-Paden-Etowah soil association in the southern part of the county. It has developed from loess or loesslike silt under-

lain by old alluvium, or from the loessal materials variously mixed with the alluvium.

Profile description:

- 0 to 6 inches, grayish-brown to yellowish-brown mellow silt loam; 0 to 8 inches thick.
- 6 to 26 inches, reddish-brown or yellowish-brown friable silty clay loam; 12 to 24 inches thick.
- 26 inches +, reddish-brown to brownish-red moderately friable silty clay loam to gravelly clay loam splotched with gray and yellow; 2 to 10 feet or more thick.

A considerable part of the original surface layer has been lost as a result of erosion. Some mixing of the original surface soil and the subsoil has taken place in the plow layer; consequently, the present surface layer is variable in color and texture. Small severely eroded spots are common, and there are occasional shallow gullies.

The soil is strongly acid and moderate in organic matter, plant nutrients, and water-holding capacity. It is very permeable; roots penetrate all layers.

Present use and management.—All of Pickwick silt loam, eroded hilly phase, is cleared and has been used for crops and pasture. Now, it is chiefly idle or left as unimproved pasture. Only a small acreage is cropped. Management practices now used are not adequate to stabilize erosion; most areas are becoming progressively more eroded and less productive. Both crop and pasture yields are low.

Use and management requirements.—This soil is not suitable, or at best, very poorly suitable for crops. It has strong slopes and is highly susceptible to erosion. Nevertheless, good pastures can be established and maintained. For best results a good sod-forming pasture mixture that includes legumes should be sown after lime and phosphate have been applied. Some of the more severely eroded spots may need nitrogen, preferably supplied in barnyard manure, before a stand can be established. Grazing must be carefully regulated so as to have protective sod on the soil at all times.

Pickwick silty clay loam, severely eroded hilly phase (12–30% slopes) (P_N).—Highly dissected areas on the old high terraces of the Tennessee River, chiefly in the southern part of the county, are occupied by this soil. Closely associated with it are Etowah and Paden soils.

Most of this soil is in the Pickwick-Paden-Etowah soil association. Its material consists of loess or loesslike materials underlain by old alluvium or various mixtures of loessal material and alluvium. The alluvium washed partly from upland soil underlain by limestone.

Profile description:

- 0 to 4 inches, yellowish-brown, grayish-brown, or reddish-brown friable silty clay loam; 0 to 6 inches thick.
- 4 to 24 inches, reddish-brown or yellowish-brown friable silty clay loam; 12 to 24 inches thick.
- 24 inches +, reddish-brown to brownish-red moderately friable silty clay loam to gravelly clay loam splotched with gray and yellow; 2 to 10 feet or more thick.

Most of the original surface soil and, in places, a part of the subsoil have been lost as a result of erosion. Shallow gullies are common. In most places the intergully areas still have a considerable part

of the original surface soil. The present surface layer is extremely variable in color and texture because it has been mixed with the subsoil during tillage.

The soil is strongly acid, low in organic matter, and moderately low in plant nutrients and water-holding capacity. It is very permeable; roots penetrate all layers. External drainage is rapid; internal drainage, moderate to rapid. The surface soil and subsoil are relatively free of gravel, but the substratum is gravelly in many places.

Present use and management.—All of Pickwick silty clay loam, severely eroded hilly phase, has been cleared for crops and pasture. Use and management were not well adjusted to the soil. Removal of the plant nutrients by continuous cropping, erosion, and lowering of the water-holding capacity attendant on erosion progressively lower yields. Now, most of this soil is in unimproved pasture, is left idle, or is wasteland. A very small part is cropped. Crop and pasture yields are very low.

Use and management.—This soil has been so severely injured by erosion that it is no longer suitable for crops and only poorly suitable for pasture. With good management fair to good pastures can be established and maintained. Good management would include seeding with a good sod-forming pasture mixture that includes legumes; fertilization; and probably some means of diverting water. Lime, phosphate, and possibly nitrogen would be needed to establish and maintain the pasture. Barnyard manure, if available, would greatly help in establishing a stand on the most severely eroded spots.

Terraces are generally not advisable on these slopes, but a diversion ditch or terrace to prevent runoff from adjoining higher lying soils may be helpful, especially in preventing continued gullying. If the grazing is controlled and the soil is properly fertilized, pastures should improve with age.

Pickwick silty clay loam, severely eroded rolling phase (5–12% slopes) (Po).—This severely eroded well-drained soil occurs on old high Tennessee River terraces. It is chiefly in the Pickwick-Paden-Etowah soil association, where it is closely associated with Etowah and Paden soils and other Pickwick soils. The soil is derived from loess or loesslike silt underlain by old alluvium or from variable mixtures of loessal material and alluvium. The old alluvium came from soils underlain by a variety of rocks; much of the material came from soils underlain by limestone.

Profile description:

- 0 to 4 inches, yellowish-brown, grayish-brown, or reddish-brown friable silty clay loam; 0 to 6 inches thick.
- 4 to 28 inches, reddish-brown or yellowish-brown friable silty clay loam; 18 to 24 inches thick.
- 28 inches +, reddish-brown to brownish-red moderately friable silty clay loam spotted with gray and yellow; 2 to 10 feet or more thick.

This soil is severely eroded. Most of the original surface soil and, in places, part of the subsoil have been removed. The plow layer is largely in the subsoil material; consequently, the color and texture of the present surface soil are more like those of the subsoil. Shallow gullies are common; a few not crossable with heavy farm machinery are present in places.

The soil is strongly acid, low in organic matter, moderate in plant nutrients, and moderate in water-holding capacity. Roots easily penetrate all layers, and the soil is well aerated. External drainage is moderately rapid, and internal drainage is moderate. The surface soil and subsoil are relatively free of gravel.

Present use and management.—All of Pickwick silty clay loam, severely eroded rolling phase, has been cleared and used for crops and pasture, but now it is largely idle land or wasteland. A small acreage planted to cotton and miscellaneous crops produces very low yields. A part of the soil is in unimproved pasture. Very few farmers are using good management for the purposes of checking erosion and rebuilding the soil.

Use and management requirements.—This soil now has very low productivity and poor physical suitability for tilled crops. If it is to be cropped, a management program including crop rotation and fertilization is needed. The rotation should be long and consist chiefly of close-growing crops, including deep-rooted legumes. Lime, phosphate, and possibly nitrogen will be needed to establish a stand of alfalfa or red clover, but sericea can be established with little fertilization or advance preparation. After a legume crop is established it should remain as long as is economically feasible.

A small grain following the legume is desirable because it is a close-growing crop that aids in controlling erosion and because the moisture supply is higher for it than for the later maturing corn crop. Phosphorus will be needed for high yields of all crops, but the need for potash will depend on the crop. The legume should supply most of the nitrogen needed by other crops in the rotation if it is properly inoculated and fertilized.

Properly constructed terraces should expedite rebuilding of soil productivity by slowing runoff, increasing absorption of water, and thus increasing supplies of moisture for growing plants. Yields, however, would be expected to be low for one or two rotation periods after terraces were built.

Robertsville silt loam (1-3% slopes) (RA).—This poorly drained gray soil is confined largely to terraces of the Tennessee River, but some areas are on low terraces along tributary streams. The soil is in the Huntington-Egam-Wolftever and Pickwick-Paden-Etowah soil associations and is closely associated with Wolftever, Taft, Paden, and Egam soils. The old alluvium from which it has developed washed from upland soils underlain by a wide variety of rocks, some of which are limestone. Development of the soil took place on nearly level to slightly depressed areas under a forest of water-tolerant trees.

Profile description:

- 0 to 10 inches, gray mellow silt loam spotted with rust brown; 8 to 12 inches thick.
- 10 to 22 inches, friable silty clay loam highly mottled with gray, yellow, and rust brown; 14 to 18 inches thick.
- 22 to 44 inches (siltpan or claypan) very compact gray to bluish-gray silt loam to heavy silty clay spotted with yellow and rust brown; 16 to 24 inches thick.
- 44 inches +, moderately friable silty clay loam mottled with gray and yellow; 2 to 10 feet thick.

The profile characteristics vary. The soil along the small streams in association with Humphreys soil differs from the rest chiefly in

being lighter textured and in having a very weak siltpan. Some areas on low terraces of the Tennessee River have a claypan, not a siltpan. The surface layer varies in thickness and is influenced by additions of recent alluvium in many places. All the variations and inclusions are poorly drained; they do not significantly influence the use of the soil described.

This soil is very strongly acid and low in organic matter and plant nutrients. The highly mottled gray profile indicates that the water table is high much of the time. The relatively impermeable compact layer greatly retards or almost prohibits passage of water. The surface soil and subsoil are permeable to air, roots, and water in dry periods when they are not saturated with water. The soil is free of gravel in most places, but that associated with the Humphreys soil contains some water-worn chert. External drainage is slow to very slow.

Present use and management.—Much of Robertsville silt loam is still wooded with water-tolerant trees such as willow oak, willow, cypress, sweetgum, and blackgum. An estimated 60 percent has been cleared, but most of this is now idle or has a cover of second-growth brush. A few acres used for crops produce extremely variable and disappointingly low yields. The cropped areas are managed like associated Wolftever or Paden soils; consequently, management is not adapted to the soil.

Use and management requirements.—Robertsville silt loam is too poorly drained for most common crops of the county. It is fairly well suited to a few crops, particularly sorghum cane, soybeans, and others that may be planted late in spring. Lespedeza does fairly well on areas that have fair surface drainage. The soil is suited to pasture but not very productive for forage. Also, it occurs chiefly in long narrow areas too small to form separate fields, that are surrounded by soils being cropped.

Surface drainage with open ditches would broaden the use suitability to some extent and increase the average yield of some forage crops and pasture. Because of the relatively impermeable compact layer, tiling probably would not improve drainage much. Application of lime, phosphate, and potash would improve the pastures, but unfavorable moisture conditions would restrict response to these amendments.

Rolling stony land (Talbot and Colbert soil materials) (5–12% slopes) (Rb).—This land type occurs in uplands underlain by limestones, chiefly in the southeastern part of the county in the Talbot-Emory-Lindside soil association. It is associated principally with Talbot, Maury, Inman, Emory, and Lindside soils. Numerous limestone outcrops that prevent use for crops characterize this land (pl. 2, B). The forest consists chiefly of cedars, but in some places is predominantly deciduous.

About one-third to two-thirds of this land type consists of limestone bedrock outcrops. The spaces between the outcrops are filled with heavy-textured soil material ranging from a few inches to 3 feet thick. This material has properties similar to that of the Talbot or Colbert soils. It is yellow or red silty clay loam to silty clay. In addition to the bedrock outcrops, loose chert and limestone fragments are scattered over the land in many places.

Present use and management.—Practically all of Rolling stony land (Talbot and Colbert soil materials) is in forest consisting chiefly of cedar. The forest has been cut over a number of times, and the present stand is sparse and small.

Use and management requirements.—This stony land type is unsuitable for crops and very poorly suitable for pasture. It is physically best suited to woodland, but a few of the less stony areas may be suitable for pasture under certain conditions.

Rough gullied land (Cuthbert and Luverne soil materials) (5–30% slopes) (Rc).—This land type has a close network of gullies that have largely destroyed the former soil layers. Its very small areas are chiefly in the Dulac-Savannah-Briensburg, Ruston-Cuthbert-Savannah, and Safford-Cuthbert-Ruston soil associations. Cuthbert fine sandy loam or other soils underlain by Coastal Plain clays or sandy clays originally covered these areas. The soil material exposed consists of clay or sandy clay highly mottled with red, yellow, and gray. Many areas were covered by a thin loess mantle, and remnants of this layer—including the siltpan found in such soils as the Dulac and Tippah—remain.

Practically all of this land is now abandoned. A few areas have been reforested, but many are covered with a sparse growth of wild grasses or scrub trees. A large acreage has no vegetation of any kind. As it is now this land has little value to its owners. Moreover, it is a liability because the vegetation it now supports is not effective in checking active erosion; therefore, adjacent uneroded uplands will be encroached upon by headward cutting of gullies. Also, nearby colluvial and bottom lands will have their productivity reduced by the accumulations of heavy, infertile subsoil materials washed from this land and deposited over them.

This land type is unsuited to crops or pasture and is extremely difficult to reforest. Considerable advance preparation, including fertilization, will be needed to establish trees.

Rough gullied land (Etowah and Dexter soil materials) (5–30% slopes) (Rp).—This land type, occurring as small areas in the Pickwick-Paden-Etowah and the Freeland-Hymon-Beechy soil associations, is characterized by a close network of gullies that have largely destroyed former soil layers. The gullies are rarely more than 3 or 4 feet deep. Etowah and Dexter soils originally covered most areas. The soil material now exposed consists chiefly of reddish-brown or brownish-red clay loam or sandy clay loam, though remnants of original soil profiles remain in most places.

Practically all of this land is now abandoned, and a large part of it has no vegetation. Second-growth trees are becoming established on some of the older abandoned areas, and a few areas have been reforested by the farmers with the help of public agencies. The present vegetation effectively checks erosion only in some of the older areas. The soil material is permeable, fair in water-holding capacity, and suitable for reforestation with a minimum of advance preparation. Kudzu vines are easily established and, if fertilized with phosphate, will check erosion more quickly than trees.

Rough gullied land (Freeland and Paden soil materials) (5–12% slopes) (Re).—The small areas of this land type occur in the Pick-

wick-Paden-Etowah and Freeland-Hymon-Beechy soil associations. A close network of gullies have largely destroyed soil layers formerly covering the area. The gullies are shallow in most places; few have cut through the siltpan layers of the Paden and Freeland soils that once covered the area. The soil material now exposed consists chiefly of compact highly mottled silty clay loam or clay loam.

Practically all of this land is abandoned; most of it has no vegetation. Reforestation by natural reseeding is very slow, and erosion becomes progressively worse for years after the areas are abandoned. Some areas have been reforested by farmers with the help of public agencies, but these projects have not been very successful. The materials exposed are not only low in plant nutrients but also extremely low in water-holding capacity. Considerable advance preparation, including fertilization, will be required before forests can be established.

Rough gullied land (Savannah and Ruston soil materials) (5-30% slopes) (R_F).—This land type occurs in small areas, chiefly in the Ruston-Cuthbert-Savannah soil association. It has a close network of gullies that have largely destroyed the soil layers of Ruston or Savannah soils that originally covered most of this land type. The soil material now exposed consists chiefly of sand or light sandy clay, though remnants of the original soil profiles remain in most places.

Practically all of this land is now abandoned, and a large part of it has no vegetation. Second-growth forests are becoming established on some of the older abandoned areas, and a few have been reforested through the efforts of public agencies. The present vegetation effectively checks erosion only in some of the older abandoned areas. The adjacent uplands are encroached upon by headward-cutting gullies, and nearby colluvial and bottom lands are damaged by overwash of sandy material from this land. This land type is more easily reforested than Rough gullied land (Cuthbert and Luverne soil materials), but considerable advance preparation will be required before forests can be established.

Rough gullied land (Talbot soil material) (5-30% slopes) (R_G).—This land type occurs in small areas, chiefly in the Talbot-Emory-Lindside soil association. It has a close network of gullies that have largely removed the original surface soil and subsoil layers. Talbot soils are thought to have covered most of the areas. The soil material now exposed consists chiefly of yellowish-red silty clay, but some remnants of the Talbot soil profiles remain. In many places bedrock has been exposed.

Practically all areas of this land are abandoned. A few areas have been reforested, but much of the land is covered with a sparse growth of cedar and other scrub trees. It is unsuited to crops or pasture and in most places it should be reforested. Erosion often can be checked more quickly with kudzu vines than with trees. Considerable advance preparation is needed to establish trees.

Rough gullied land (Tippah and Dulac soil materials) (5-12% slopes) (R_H).—The small areas of this land type occur chiefly in the Dulac-Savannah-Briensburg soil association. The original surface soil and subsoil have been almost completely removed in most places

(pl. 5, A). The material exposed consists largely of siltpan layers of Tippah and Dulac soils. A few gullies have cut through this siltpan and exposed heavy acid clays.

Under natural conditions this land type supports little vegetation and it continues to encroach gradually on adjacent soils. The productivity of nearby colluvial and alluvial soils is reduced by deposits of infertile materials washed from this land type. Erosion is extremely difficult to control. The material exposed is very strongly acid to extremely acid, and the water-holding capacity is extremely low. Considerable advance preparation, including fertilization, is necessary before trees can be established.

Ruston fine sandy loam, hilly phase (12-30% slopes) (R_L).—This well-drained upland soil, sandy throughout, is in the Coastal Plain section. It occurs in the Ruston-Cuthbert-Savannah soil association and also on some higher ridges in the Safford-Cuthbert-Ruston soil association. It has developed from Coastal Plain sand. The native deciduous forest consists of oaks, yellow-poplar, and chestnut.

Profile description:

- 0 to 14 inches, yellowish-gray to grayish-yellow loose fine sandy loam to loamy fine sand; 12 to 16 inches thick.
- 14 to 26 inches, reddish-brown or brownish-red very friable fine sandy clay loam; 10 to 14 inches thick.
- 26 inches +, brownish-red very friable light sandy clay loam highly spotted or streaked with gray and yellow; grades into stratified layers of red and gray sand at a depth of about 60 inches in most places; 2 to 15 feet thick.

The soil is strongly to very strongly acid and moderate to low in organic matter and plant nutrients. It is readily permeable to air, roots, and water. External and internal drainage are rapid. It has a moderately low water-holding capacity. In many places a few ferruginous sandstone fragments are on the surface and throughout the profile.

Present use and management.—Practically all of Ruston fine sandy loam, hilly phase, is still wooded with chestnut, yellow-poplar, and red and white oaks. The stand has been cut over many times, and now consists of small trees and many culls. Trees grow comparatively rapidly.

Use and management requirements.—This soil is moderately productive of most common field crops but is extremely susceptible to erosion and therefore not suitable for either crops or pasture. Prevention of accelerated erosion is very difficult because slopes are steep and the sandy soil material is easily eroded. The soil is probably best used as woodland.

If it is necessary to use this soil for pasture, it should be sodded soon after the forest cover is removed. A heavy sod-forming pasture mixture should be used, for it has been observed that lespedeza and other plants commonly used will not control erosion. Lime and phosphate are needed to establish the sod. Carefully controlled grazing is necessary to keep a good sod at all times and prevent erosion.

Ruston fine sandy loam, eroded hilly phase (12-30% slopes) (R_K).—This well-drained sandy upland soil is in the Coastal Plain section of the county. It occurs chiefly in the Ruston-Cuthbert-

Savannah soil associations but is also on some higher ridges in the Safford-Cuthbert-Ruston soil associations. It has developed from sandy Coastal Plain materials under deciduous forest.

Profile description :

- 0 to 8 inches, grayish-yellow loose very friable fine sandy loam; 0 to 10 inches thick.
- 8 to 20 inches, reddish-brown or brownish-red very friable fine sandy clay loam; 10 to 14 inches thick.
- 20 inches+, brownish-red very friable light sandy clay loam lightly spotted with gray and yellow; 2 to 15 feet thick; grades into stratified layers of red and gray sands.

A considerable part of the original surface soil has been eroded away. Small severely eroded spots are common and show conspicuously because the red subsoil has been exposed. The plow layer now consists largely of remnants of the original surface layer, which in some places have been mixed with the subsoil. Shallow gullies are fairly common in places.

The soil is very strongly acid and moderate to low in organic matter and plant nutrients. It is readily permeable to air, roots, and water. External and internal drainage are rapid. The water-holding capacity is low. In many places a few ferruginous sandstone fragments are on the surface and throughout the profile.

Present use and management.—All of Ruston fine sandy loam, eroded hilly phase, has been cleared and cropped, though it is now largely in unimproved pasture or idle. Cotton and cowpeas are the principal crops, but other crops such as corn and lespedeza are grown to a limited extent. The soil was moderately productive when first cleared, but it was common practice to plant row crops such as corn and cotton until yields were very low and then allow the land to lie idle. The wild growth now on idle land is not sufficient to check erosion; consequently, the soil becomes severely eroded in a very short time. Even when sown to a close-growing crop such as lespedeza, the soil is seriously damaged by erosion.

Use and management requirements.—This soil is not suitable for either crops or pasture. It is highly susceptible to erosion, and a cover that will prevent erosion, particularly gullying, is very difficult to maintain. The soil is probably best used as woodland and is not so difficult to reforest as the Cuthbert, Dulac, or other similar soils. Shortleaf and loblolly pines do well and usually stabilize erosion within a few years if gullying is prevented by mechanical means. Black locust also does well on the fill material behind check dams.

Ruston fine sandy loam, steep phase (30+ % slopes) (Rm).—This steep sandy well-drained upland soil is largely confined to the Ruston-Cuthbert-Savannah soil association. It has developed from sandy Coastal Plain materials under deciduous forest.

Profile description :

- 0 to 14 inches, yellowish-gray to grayish-yellow loose fine sandy loam to loamy fine sand; 10 to 18 inches thick.
- 14 to 24 inches, reddish-brown or brownish-red very friable fine sandy clay loam; 8 to 16 inches thick.
- 24 inches+, brownish-red very friable light sandy clay loam lightly spotted and streaked with gray and yellow; in most places layer grades into stratified layers of red and gray sand at a depth of 4 or 5 feet; 2 to 15 feet thick.



A, Accelerated erosion on Rough gullied land (Tippah and Dulac soil materials) in foreground has exposed heavy acid clay worthless for agriculture.
B, Plowed cropland on Sequatchie fine sandy loam; Melvin, Egam, and Bruno soils on left.
C, Bedrock outcrops on Talbott stony silty clay loam, eroded rolling phase.

This phase varies in degree of profile development. Its various layers are not so distinct as those of Ruston fine sandy loam, hilly phase, and are almost unrecognizable in many places.

The soil is strongly to very strongly acid and moderately low in organic matter and plant nutrients. It is readily permeable to air, roots, and water. External and internal drainage are very rapid or rapid. The water-holding capacity is low. Small sandstone fragments are on the surface and throughout the profile in many places. A small acreage having strongly plastic sandy clay subsoil is included.

Present use and management.—Practically all of Ruston fine sandy loam, steep phase, is covered by chestnut, yellow-poplar, and red and white oaks. The chestnut trees, however, have been killed by blight. The areas have been cut over several times. The stand now consists of small trees and many culls. The trees grow fairly rapidly, but timber production is lowered considerably by fire and grazing.

Use and management requirements.—Chiefly because of steepness and extreme susceptibility to erosion, this soil is not suitable for crops or pasture. It is apparently best used for forest on most farms. The management will be concerned with improving the quality and productivity of the timber.

Ruston sandy clay loam, severely eroded hilly phase (12–30% slopes) (RN).—This severely eroded well-drained soil occurs on upland slopes, largely in the Ruston-Cuthbert-Savannah soil association. Some areas are in the Safford-Cuthbert-Ruston soil association. The soil has developed from sandy Coastal Plain materials.

Profile description:

- 0 to 4 inches, grayish-yellow to reddish-brown very friable fine sandy clay loam or fine sandy loam; 0 to 8 inches thick.
- 4 to 16 inches, reddish-brown or brownish-red very friable fine sandy clay loam; 10 to 14 inches thick.
- 16 inches +, brownish-red very friable light sandy clay loam lightly spotted with gray and yellow; 2 to 15 feet thick.

In most places nearly all of the original surface soil has been lost. Gullies are numerous. Many are shallow and can be crossed with heavy farm machinery, but there are also many deep V-shaped ones that cannot be crossed. Gully erosion has been severe, but the intergully areas still have a large part of the original surface soil. In many places the present surface layer is heavier textured because it has been mixed during tillage.

The soil is very strongly acid and low in organic matter and plant nutrients. It is readily permeable to air, roots, and water. Internal and external drainage are rapid. The water-holding capacity is low. A few small sandstone fragments are on the surface and throughout the profile in many places.

Present use and management.—All of Ruston sandy clay loam, severely eroded hilly phase, has been cleared and used for crops or pasture, but practically all of it is now idle. Most of the soil was abandoned before it was severely eroded; the wild growth was not adequate to check erosion. Some areas are beginning to reforest naturally, chiefly with sassafras, persimmon, and post and blackjack oaks. Yellow-poplar grows in places.

Use and management requirements.—This soil is not suitable for crops or pasture. It has been severely injured by erosion; productivity has been lowered by loss of organic matter and plant nutrients, and by the lowering of the water-holding capacity. On most farms this soil is probably best used as woodland.

Management for this soil will be concerned chiefly with stabilizing erosion, which probably can be most quickly and economically accomplished by reforestation. Reforestation will require preliminary preparation such as building check dams in gullies, contour furrowing, mulching, and fertilization. Loblolly and shortleaf pines grow well on this soil; black locust trees grow fairly well on fill material.

Safford very fine sandy loam, hilly phase (12–30% slopes) (S_B).—This well-drained heavy-textured soil occurs in relatively large areas on ridge slopes throughout the Safford-Cuthbert-Ruston soil association, chiefly in association with Dulac, Cuthbert, Ruston, Eupora, and Hymon soils. It is characterized by a thin surface soil and a heavy reddish-brown clay subsoil. The forest cover is predominantly beech and white oak but includes other varieties of oak and hickory. The soil has developed from Coastal Plain sandy clays that are high in mica and green sand and in potash.

Profile description:

- 0 to 6 inches, yellowish-gray to grayish-yellow loose very fine sandy loam to silt loam; 5 to 8 inches thick.
- 6 to 24 inches, reddish-brown strongly plastic clay or silty clay; extremely well developed fine angular nut structure; 14 to 20 inches thick.
- 24 inches +, reddish-brown strongly plastic clay, splotched with greenish gray, that grades into highly mottled red, brown, yellow, and greenish-gray sandy clay; 2 to 5 feet thick.

The soil is very strongly acid throughout and contains a moderate quantity of organic matter. Compared with other upland soils of the county, it is moderately high in plant nutrients, especially potash. External drainage is rapid, but internal drainage is moderately slow. The soil is moderately to slightly permeable to air, roots, and water. It is free of gravel, but numerous small ferruginous sandstone fragments are in the surface layer in many places.

Present use and management.—All of the hilly phase of Safford very fine sandy loam is wooded, chiefly with beech and white oak, but with many other trees as well. The present stand is small, but of excellent quality in most places. Timber probably grows more rapidly on this soil than on any other in the uplands.

Use and management requirements.—The soil is unsuitable for crops, and though it is suited to pasture in most places, it is probably best used for forests. When cleared the soil is highly susceptible to severe erosion. Its tough plastic subsoil causes moderately slow internal drainage and correspondingly increased runoff. Runoff is difficult to control, and the soil erodes rapidly. The freshly cleared soil should be seeded with a sod-forming pasture mixture before the thin surface soil has been lost. To maintain a good pasture, applications of lime and probably phosphate are needed. Grazing should be carefully controlled so as to maintain a good sod at all times.

Safford clay loam, severely eroded hilly phase (12–30% slopes) (S_A).—The small areas of this severely eroded well-drained upland soil occur on ridge slopes, largely in the Safford-Cuthbert-Ruston

soil association. The soil, characterized by a reddish-brown, heavy-textured clay subsoil, has developed from sandy clays high in mica and green sand. The native deciduous forest consisted chiefly of beech and white oak.

Profile description :

- 0 to 2 inches, grayish-yellow to reddish-brown moderately plastic clay loam ; 0 to 5 inches thick.
- 2 to 20 inches, reddish-brown strongly plastic clay or silty clay ; 14 to 20 inches thick.
- 20 inches +, reddish-brown strongly plastic clay, splotted with greenish-gray sandy clay ; 2 to 5 feet thick.

This soil is severely eroded. Most of its original surface soil and, in places, a part of the subsoil have been lost. Small shallow gullies are common, and a few gullies cannot be crossed with heavy farm machinery. A very small part of the light-textured original surface layer remains, even on the intergully areas.

The soil is very strongly acid and low in organic matter. It is moderately high in plant nutrients, especially potash. External drainage is very rapid, but internal drainage is moderately slow. The soil is moderately to slightly permeable to air, roots, and water. The water-holding capacity is low. The plow layer contains numerous small sandstone fragments in many places.

Present use and management.—All of Safford clay loam, severely eroded hilly phase, has been cleared and used for crops or pasture, but practically all of it is now wasteland. A small part is in unimproved pasture. Pasture yields are very low, and the plant cover is not sufficient to prevent further erosion in many places.

Use and management requirements.—This soil is now so severely eroded that it is unsuitable for crops or pasture. Probably it is best used and managed for forest. Reforestation will be difficult because so little moisture is available for young trees. The heavy clay subsoil absorbs water slowly, and most of the rainfall is lost in runoff. Contour furrows, check dams, and mulching will probably be necessary to slow runoff and increase absorption. Young trees grow rapidly if the supply of moisture is adequate.

Savannah clay loam, severely eroded rolling phase (5-12% slopes) (Sc).—Areas of this severely eroded moderately well drained upland soil occur on ridge slopes in the Ruston-Cuthbert-Savannah and the Dulac-Savannah-Briensburg soil associations. The soil has a sandy texture and a hardpan at a depth of about 2 feet. Its parent material consists of sandy Coastal Plain materials, with probably a small admixture of loess. The soil has developed under deciduous forest.

Profile description :

- 0 to 4 inches, grayish-yellow to light yellowish-brown friable loam to clay loam ; 0 to 6 inches thick.
- 4 to 24 inches, yellowish-brown to brownish-yellow friable clay loam to light silty clay loam ; 16 to 24 inches thick.
- 24 to 36 inches (hardpan) compact fine sandy loam to clay loam mottled with gray, yellow, and brown ; 8 to 16 inches thick.
- 36 inches +, yellowish-brown or reddish-brown fine sandy clay loam splotted and streaked with gray and yellow ; 1 to 4 feet thick.

This soil is severely eroded ; most of the original surface soil and a part of the subsoil have been lost in most places. Shallow gullies are

common, but in most places patches of the original surface soil remain in the intergully areas. A few gullies have cut through the hardpan and exposed the reddish-brown underlying material. Most of the present plow layer consists of subsoil material.

The soil is low in organic matter and plant nutrients and strongly to very strongly acid. External drainage is moderate to rapid, but internal drainage is moderately slow. The surface soil and subsoil are permeable to air, roots, and water, but the hardpan is only slightly permeable. The water-holding capacity is low or very low. The soil is relatively free of stones or gravel.

Present use and management.—All of Savannah clay loam, severely eroded rolling phase, is cleared and has been used for crops and pasture, but most of it is now idle land or wasteland. A small acreage is in unimproved pasture, but very little is cropped. Crop and pasture yields are extremely low. The severe erosion indicates improper use and management in the past.

Use and management requirements.—This soil has been severely injured by erosion and is now unsuitable for crops. It probably can be used and managed to best advantage for pasture, though it is poorly suited to that use. Lime, phosphate, and possibly potash will be necessary to establish and maintain good pastures. The pasture mixture should include legumes, but even so, nitrogen fertilizers may be needed to establish the sod. Terraces may be necessary to control runoff and erosion until the sod is well established.

If it is necessary to use this soil for crops, the rotation should be long and include many close-growing crops. The rotation should include grasses and legumes, preferably those that are deep-rooted. These crops are difficult to establish, but sericea and sweetclover can be established and maintained if the soil is properly treated with lime and phosphate. All crops will need fertilizer. Cultivation should be on the contour, and if slopes are long, strip cropping should be practiced. Terraces probably will be needed to slow runoff and thus aid in controlling erosion.

Savannah loam, rolling phase (5-12% slopes) (S_F).—This is the only upland hardpan soil with a sandy surface soil. It occurs on narrow ridge crests in the Ruston-Cuthbert-Savannah soil association and on ridge slopes in the Dulac-Savannah-Briensburg association. It appears similar to the Dulac soils and differs from them chiefly in being sandy throughout the profile. It has developed from sandy Coastal Plain materials that contain an admixture of loess. The native vegetation is deciduous forest.

Profile description:

- 0 to 8 inches, yellowish-gray to grayish-yellow very friable very fine sandy loam to loam; 6 to 10 inches thick.
- 8 to 28 inches, yellowish-brown to brownish-yellow friable clay loam to light silty clay loam; 16 to 24 inches thick.
- 28 to 40 inches (hardpan) compact fine sandy clay loam to clay loam mottled with gray, yellow, and brown; 8 to 16 inches thick.
- 40 inches +, yellowish-brown or reddish-brown fine sandy clay loam splotched and streaked with gray and yellow; 1 to 4 feet thick.

This soil is low in organic matter and plant nutrients and strongly to very strongly acid. External drainage is moderate, but internal drainage is moderately slow. The surface soil and subsoil are permeable to air, water, and roots, but the hardpan is only slightly

permeable. The water-holding capacity is low. The soil is relatively free of gravel or stones.

Included are some small areas of Savannah soils that have 2- to 5-percent slopes, and a few sandier areas that do not have a hardpan. These inclusions differ somewhat in use and management requirements but are relatively unimportant because of their small acreage.

Present use and management.—All of Savannah loam, rolling phase, is in deciduous forest consisting principally of white, red, blackjack, and post oaks and pignut hickory. Most areas have been cut over a number of times and now support a stand of small trees that includes many culls. The trees grow moderately slowly.

Use and management requirements.—This soil is physically suitable for crops and pasture. Much of it lies adjacent to existing fields or in areas large enough to be economically cultivated, but a considerable acreage is in long narrow areas that are associated with steep Ruston soils not suited to crops or pasture.

The soil has good tilth, moderate slopes, and no stones or gravel; consequently, it is easy to cultivate. On the other hand, it is low in organic matter, lime, phosphorus, potash, and probably most other plant nutrients. In addition it has a hardpan that restricts internal drainage and root penetration. Chiefly because of the low fertility and low water-holding capacity, the soil is relatively low in productivity and somewhat limited in crop adaptation. It is fairly well suited to most of the crops commonly grown in the county, but fertilization is needed for good yields. If cleared and used for crops, management practices should be similar to those for the eroded rolling phase of Savannah loam.

Savannah loam, eroded rolling phase (5–12% slopes) (S_D).—This moderately well-drained hardpan soil of the uplands has a sandy surface layer. It occurs on ridge crests in the Ruston-Cuthbert-Savannah soil association and on ridge slopes in the Dulac-Savannah-Briensburg soil association. It has developed from sandy Coastal Plain materials that apparently contain an admixture of loess. The native vegetation was deciduous forest.

Profile description:

- 0 to 6 inches, grayish-yellow to light yellowish-brown friable loam; 0 to 8 inches thick.
- 6 to 26 inches, yellowish-brown to brownish-yellow friable clay loam to light silty clay loam; 16 to 24 inches thick.
- 26 to 38 inches, (hardpan) compact fine sandy loam to clay loam mottled with gray, yellow, and brown; 8 to 16 inches thick.
- 38 inches +, yellowish-brown or reddish-brown fine sandy clay loam splotched and streaked with gray and yellow; 1 to 4 feet thick.

Erosion has removed a considerable part of the original surface soil. In many places the original surface layer has been mixed with the subsoil to form a plow layer heavier textured than the original surface soil. Small severely eroded spots are common; these are conspicuous because the subsoil has been exposed. A few shallow gullies occur, but they can be obliterated during tillage.

The soil is low in organic matter and plant nutrients and strongly to very strongly acid. External drainage is moderate; internal drainage, moderately slow. The surface soil and subsoil are permeable, but the hardpan is only slightly permeable. The water-holding capacity is low. The soil is relatively free of gravel or stone. Included are

some areas that are sandier than the soil described and that do not have a hardpan.

Present use and management.—All of this soil has been cleared, and most of it is being used for crops or pasture (pl. 4, *B*). About 15 percent is used for corn, 10 percent for cotton (pl. 4, *O*), 15 percent for hay, 10 percent for pasture, and 10 percent for miscellaneous crops. Some 40 percent is land left idle or wasteland. Systematic crop rotation is not practiced; fertilizers are used only on the cash crop. Cotton is generally fertilized with an inadequate quantity of low-analysis fertilizer. Under common management expectable acre yields are 16 bushels of corn, 220 pounds of cotton, and 0.7 ton of lespedeza hay.

Use and management requirements.—The eroded rolling phase of Savannah loam is physically well suited to the common field crops but its low fertility and low water-holding capacity make it low in natural productivity. The soil responds readily to good management but is difficult to maintain at a high level of production. Productivity can be maintained at a much higher level than at present, however, by using a moderately long crop rotation that includes legumes and grasses and by proper and adequate fertilization.

Lime and phosphate are essential for best results with legumes, and better protection of the soil can be obtained if cover crops are similarly treated. All crops need phosphate and all except the legume crop and the crop immediately following need nitrogen. Many crops, especially cotton, need potash. In most places the supply of organic matter is very low and should be increased and maintained at a higher level. Growing grasses and plants for green manure and applying barnyard manure will increase the supply of organic matter and substantially improve yields.

In addition to crop rotation and fertilization, it may be necessary to use special measures for runoff and erosion control. Contour farming, or if the slopes are long, contour strip cropping, will aid in preventing further erosion. Terraces may be necessary to prevent excessive runoff. Since the hardpan under this soil is more permeable than that under the Dulac soils, terraces can be expected to be more effective. Under good management expectable acre yields are 35 bushels of corn, 380 pounds of cotton, and 1.2 tons of lespedeza hay.

Savannah loam, undulating phase (2-5% slopes) (Sg).—Ridge crests in the Ruston-Cuthbert-Savannah and the Dulac-Savannah-Briensburg soil associations are occupied by this moderately well-drained phase. The surface soil is sandy, and a hardpan lies at a depth of about 2 feet. The soil has developed from Coastal Plain sand or light sandy clay with a small admixture of loess. The cover is deciduous forest.

Profile description:

- 0 to 8 inches, yellowish-gray to grayish-yellow very friable loam; 6 to 10 inches thick.
- 8 to 26 inches, yellowish-brown to brownish-yellow friable clay loam to light silty clay loam; 14 to 22 inches thick.
- 26 to 40 inches, (hardpan) compact fine sandy loam to clay loam mottled with gray, yellow, and brown; 10 to 18 inches thick.
- 40 inches +, yellowish-brown or reddish-brown fine sandy clay loam splotched and streaked with gray and yellow; 1 to 4 feet thick.

This soil is low in organic matter and plant nutrients and strongly to very strongly acid. External drainage is moderate, but internal

drainage is moderately slow. The surface soil and subsoil are permeable, but the hardpan is only slightly permeable. The water-holding capacity is low. The soil is relatively free of gravel or stone.

Present use and management.—Practically all of Savannah loam, undulating phase, is in forest consisting of white, red, blackjack, and post oaks, and pignut hickory. Most areas have been cut over; the present stand is small and includes many culls. The trees grow moderately slowly.

Use and management requirements.—The soil is physically suited to the common field crops of the county, but chiefly because of its low fertility and low water-holding capacity, it has relatively low productivity and somewhat limited adaptability to crops. If it is cleared and used for crops and pasture, use and management practices will be similar to those for Savannah loam, eroded rolling phase. This soil is not so susceptible to erosion as the eroded rolling phase, however, and the rotation presumably can be shorter and include more intertilled crops. Also, mechanical means of erosion control should not be necessary, though contour tillage should be practiced.

Savannah loam, eroded undulating phase (2-5% slopes) (SE).—This phase occurs on ridge crests in the Ruston-Cuthbert-Savannah and Dulac-Savannah-Briensburg soil associations. It is a moderately well-drained upland soil characterized by a sandy surface soil and a hardpan at a depth of about 2 feet. It has developed from sandy Coastal Plain materials that apparently contain a small admixture of loess. The native vegetation was deciduous forest.

Profile descriptions:

- 0 to 6 inches, grayish-yellow to light yellowish-brown friable loam; 0 to 8 inches thick.
- 6 to 24 inches, yellowish-brown to brownish-yellow friable clay loam to light silty clay loam; 14 to 22 inches thick.
- 24 to 38 inches (hardpan) compact fine sandy clay loam to clay loam mottled with gray, yellow, and brown; 10 to 18 inches thick.
- 38 inches +, yellowish-brown or reddish brown fine sandy clay loam splotched and streaked with gray and yellow; 1 to 4 feet thick.

A considerable part of the original surface soil has been lost as a result of erosion. The original surface layer has been mixed with the subsoil to form a plow layer heavier textured than the original surface soil in many places. Some severely eroded areas are included; they are conspicuous because the subsoil is exposed.

The soil is low in organic matter and plant nutrients and strongly to very strongly acid. External drainage is moderate, but internal drainage is moderately slow. The surface soil and subsoil are permeable, but the hardpan is only slightly permeable. The water-holding capacity is low.

Present use and management.—All of Savannah loam, eroded undulating phase, has been cleared and used for crops or pasture. An estimated 20 percent is now used for corn, 15 percent for cotton, 15 percent for hay, 10 percent for pasture, and 10 percent for miscellaneous crops. About 30 percent lies idle. Systematic rotation of crops is not generally practiced. Except for cotton, crops are not commonly fertilized. Under common management average acre yields are 18 bushels of corn, 240 pounds of cotton, and 0.8 tons of lespeza hay.

Use and management requirements.—This soil is physically suited to the common field crops of the county, but its low fertility and low water-holding capacity cause it to have low productivity. The soil responds readily to good management but is difficult to maintain at a high level of productivity. Its productivity can be kept at a much higher level by using a systematic crop rotation that includes legumes and grasses and by proper and adequate fertilization. The soil is similar to the eroded rolling phase in use and management requirements but less susceptible to erosion and suitable for a shorter crop rotation. Mechanical means of controlling erosion should not be necessary. Under good management expectable acre yields are: Corn, 40 bushels; cotton, 400 pounds; and lespedeza hay, 1.4 tons.

Sequatchie fine sandy loam (2–5% slopes) (SH).—Low terraces along the Tennessee River are occupied by this soil. It is in the Huntington-Egam-Wolftever soil association and closely associated with Wolftever, Bruno, Lindside, Huntington, and Egam soils. The soil has formed from alluvium washed from upland soils underlain by a wide variety of rocks, including sandstone and unconsolidated Coastal Plain sand. The areas are nearly level to undulating and are flooded infrequently. The soil has developed under deciduous forest.

Profile description:

0 to 10 inches, grayish-brown to brown very friable fine sandy loam; 8 to 12 inches thick.

10 to 30 inches, brown to yellowish-brown friable light clay loam; 18 to 24 inches thick.

30 inches +, yellowish-brown to brownish-yellow clay loam spotted with gray and yellow; 2 to 5 feet thick.

The soil is strongly acid and comparatively high in organic matter and plant nutrients. It is very permeable to air, roots, and water and is moderately high in water-holding capacity. It is relatively free of gravel or stones, but it has some large cobblestones in places.

Present use and management.—Except for 86 acres covered by the Kentucky Reservoir, practically all of this soil has been cleared and used for crops. About 40 percent is used for corn, 20 percent for cotton, 20 percent for hay, and 10 percent for miscellaneous crops. Approximately 10 percent is lying idle. Many kinds of crops are grown, but they are not systematically rotated. On most farms row crops run for 4 or 5 years and are followed by lespedeza for about 2 years. On many farms this soil is the best one for cotton and is almost continuously planted to that crop. Until recently, cotton was the only crop fertilized; now some lime and phosphate are used on the legume crop. The fertilization for cotton is about 200 pounds of superphosphate, a mixture such as 3–9–6 or 4–12–4, or a mixed low-analysis fertilizer. Under ordinary management average acre yields are 30 bushels of corn, 360 pounds of cotton, and 1.2 ton of lespedeza hay.

Use and management requirements.—Sequatchie fine sandy loam is one of the most desirable soils in the county for crops (pl. 5, B). It has a gently sloping surface, excellent tilth, a moderately high plant-nutrient content, and a high water-holding capacity. Under good management it is well suited to a wide variety of crops, including red clover and alfalfa. Although this soil has relatively high natural productivity, it responds well to good management. Much higher yields can be obtained by crop rotation and fertilization. The rota-

tion presumably can be moderately short but it should include a legume crop.

Alfalfa and other deep-rooted legumes grow successfully if properly limed and fertilized. Red clover is grown in many places without fertilizer, though lime and phosphate are required for best results. Application of lime and phosphate and incorporation of organic matter are of primary importance in any improved management program for this soil. Under good management expectable acre yields are 60 bushels of corn, 520 pounds of cotton, and 2.4 tons of red clover hay.

Shannon silt loam (0-3% slopes) (Sl).—Small areas of this well-drained soil occur on nearly level low first bottoms along many streams draining the Loess Plain and the Coastal Plain. It is associated with Hymon, Beechy, Tigrett, and Briensburg soils. The recent alluvium from which the soil has formed consists of a mixture of materials washed from upland soils derived from loess or Coastal Plain materials. The loess material apparently predominates. The native vegetation was deciduous forest. This is a young soil and does not have a textural profile.

Profile description :

0 to 12 inches, grayish-brown to brown mellow silt loam ; 8 to 16 inches thick.

12 to 30 inches, light-brown friable silt loam ; 8 to 20 inches thick.

30 inches +, brownish-gray to yellowish-brown friable silt loam or fine sandy loam spotted with gray ; 1 to 5 feet thick.

This soil is strongly to very strongly acid and comparatively high in organic matter and plant nutrients. It is very permeable to air, roots, and water. External drainage is slow or very slow, but internal drainage is moderate. The water-holding capacity is high. The soil is relatively free of gravel, but the lower layers are relatively sandy in some places.

Present use and management.—A total of 86 acres of Shannon silt loam is covered by the Kentucky Reservoir. Of the rest, about 85 percent is cleared and cropped. An estimated 65 percent of the cleared land is used for corn, 10 percent for cotton, and 15 percent for miscellaneous crops such as lespedeza, cowpeas, and soybeans. About 10 percent of the cleared land is idle. The uncleared areas are covered by a good stand of deciduous trees, largely beech, oak, and hickory. Corn is grown almost continuously on most of this soil; cotton and hay, occasionally. Fertilizers are rarely if ever used, even for the cotton crop. Under usual management average acre yields are 35 bushels of corn, 280 pounds of cotton, and 1.4 tons of lespedeza hay.

Use and management requirements.—Shannon silt loam is easy to work and conserve and relatively productive of the crops to which it is suited. Susceptibility to flooding somewhat limits its use suitability, but it is well suited to corn, annual hay crops, and many other forage crops and is suited to cotton if properly fertilized with phosphorus and potassium. Some areas are suited to cotton, but in most places the plants grow too vigorously. Small grains are not suitable; they tend to lodge and may be flooded in winter and early in spring.

The productivity of this soil is relatively high but can be materially increased by proper management. Many areas kept continuously in corn need nitrogen and possibly phosphate fertilizer for continued

high yields. The nitrogen can be supplied by using fertilizers or by turning under legumes. Lime and phosphate probably can be used profitably on the legume crop. Potash probably will be needed in most places for the cotton crop.

The periodic flooding replenishes organic matter and plant nutrient supplies in this soil by depositing additional sediment. Average yields are reduced by the occasional loss of a crop by flooding. Under good management, however, expectable acre yields are 65 bushels of corn, 480 pounds of cotton, and 1.6 tons of lespedeza hay.

Shannon fine sandy loam (0-3% slopes) (Sk).—This sandy brown well-drained soil occurs on low nearly level first bottoms, largely along streams draining the Ruston-Cuthbert-Savannah and Safford-Cuthbert-Ruston soil association areas. It is subject to flooding by the stream along which it occurs. The Hymon, Beechy, Alva, and Eupora are closely associated soils.

This soil has formed from mixed alluvium that washed from upland soil derived from Coastal Plain materials and loess. Sandy Coastal Plain material apparently predominates in this soil. The native vegetation is deciduous forest. This young soil does not have a developed textural profile.

Profile description :

0 to 10 inches, grayish-brown or brownish-gray loose fine sandy loam; 8 to 12 inches thick.

10 to 30 inches, light-brown very friable fine sandy loam; 8 to 20 inches thick.

30 inches +, brownish-gray fine sandy loam to loamy fine sand splotched with gray and rust brown; 1 to 5 feet thick.

The soil is strongly to very strongly acid and moderate in content of organic matter and plant nutrients. It is extremely permeable to air, roots, and water. External drainage is slow, but internal drainage is moderate to rapid. The water-holding capacity is moderate to high.

Present use and management.—Shannon fine sandy loam is used and managed much like Shannon silt loam, but less corn and more cotton and miscellaneous crops are grown on it. Crop yields are generally lower than on the Shannon silt loam. Under usual management practices acre yields are 30 bushels of corn, 260 pounds of cotton, and 1.3 tons of lespedeza hay. About 107 acres are now covered by the Kentucky Reservoir.

Use and management requirements.—Shannon fine sandy loam is less desirable than Shannon silt loam because crops grown on it are more susceptible to droughts and because its fertility is lower and more easily depleted by leaching and cropping. Probably the soil is suited to a somewhat wider variety of crops than Shannon silt loam. In most places it is medium to low in organic matter, nitrogen, lime, phosphate, and presumably potash. It should respond well to applications of these. The management problem is that of adding needed fertilizer in the cheapest and most efficient way. The management requirements are similar to those of Shannon silt loam.

Shubuta-Luverne fine sandy loams, rolling phases (5-12% slopes) (Sn).—This complex is on ridge crests, chiefly in the Ruston-Cuthbert-Savannah soil association. It is associated with Dulac, Cuthbert, Savannah, Ruston, Eupora, and Hymon soils. The two

soils making up the complex are so intricately associated geographically that it is not practical to show them separately on a map. Shubuta soils, covering about 60 percent of the total area, have developed from sandy clay Coastal Plain material that contains thin layers of gray clay. The forest cover on this complex consists chiefly of blackjack, post, red, and white oaks.

Profile descriptions:

Shubuta fine sandy loam, rolling phase:

- 0 to 8 inches, grayish-yellow to yellowish-gray loose fine sandy loam; 6 to 10 inches thick.
- 8 to 24 inches, yellowish-red to reddish-yellow plastic clay; 14 to 20 inches thick.
- 24 to 40 inches, plastic sandy clay highly mottled with red, yellow, and gray; 10 to 20 inches thick.
- 40 inches +, reddish-yellow sandy clay with thin platy layers of bluish-gray clay.

Luverne fine sandy loam, rolling phase:

- 0 to 8 inches, grayish-yellow loose fine sandy loam; 6 to 10 inches thick.
- 8 to 30 inches, red or brownish-red strongly plastic clay; 12 to 24 inches thick.
- 30 to 48 inches, brownish-red plastic clay splotched with yellow; 8 to 24 inches thick.
- 48 inches +, brownish-red sandy clay with thin layers of bluish-gray clay.

The soils are apparently low in organic matter and plant nutrients and are very strongly acid. They are only slightly permeable to air, roots, and water. External drainage is moderate, but internal drainage is slow. The water-holding capacity is low. Small sandstone fragments and, locally, a few small pebbles are common on the surface and throughout the profiles.

The surface soils vary from fine sandy loams to loamy fine sands; the color of the subsoils ranges from red to yellow. In some places a small quantity of loess mixed in the surface layer imparts a silty texture. Areas of Cuthbert and Dulac soils too small to map separately are included with this complex. Also included are some cleared areas from which the surface soil has been eroded. These inclusions and variations do not significantly change the management requirements of the complex.

Present use and management.—Practically all of this complex is wooded, chiefly with post, blackjack, and red oaks, and pignut hickory. The trees grow very slowly and those in the present stand are small and of poor quality. The soils will produce very little timber.

Use and management requirements.—Although the soils of this complex are physically suited to some field crops, most areas are on narrow winding ridge crests in highly dissected tracts. In such positions the land generally cannot be cultivated. In most farms it is probably best left in woods. The slowly permeable subsoil inhibits absorption and percolation of water, retards the movement of moisture, and causes alternating extreme wetness and dryness of the surface soil. Crop injury during both wet and dry periods is severe. Restricted water absorption increases surface runoff, particularly during heavy rainfall, and is probably more the cause for the extreme erodibility than any other factor.

If this complex must be used for crops, practice a rotation that consists largely of close-growing crops. Fertilization is essential. Lime,

phosphate, and probably potash will be needed. Nitrogen should be used on all crops except the legumes and the crop immediately following. Green manure and barnyard manure incorporated in the soils will tend to improve their poor tilth. Cover crops are badly needed after all row crops. Engineering devices for erosion control are not suitable in many places.

Shubuta-Luverne clay loams, eroded rolling phases (5-12% slopes) (Sm).—This complex occurs on ridge crests, chiefly in the Ruston-Cuthbert-Savannah soil association. It is closely associated with Dulac, Cuthbert, and Savannah soils and with other Luverne and Shubuta soils. The soils of this sample have developed from unconsolidated sandy clays.

Profile descriptions:

Shubuta clay loam, eroded rolling phase:

0 to 6 inches thick, grayish-yellow to reddish-yellow friable clay loam; 0 to 8 inches thick.

6 to 22 inches, yellowish-red to reddish-yellow plastic clay; 14 to 20 inches thick.

22 to 38 inches, plastic sandy clay highly mottled with red, yellow, and gray; 10 to 20 inches thick.

38 inches +, reddish-yellow sandy clay with thin platy layers of bluish-gray clay.

Luverne clay loam, eroded rolling phase:

0 to 6 inches, grayish-yellow to reddish-yellow friable clay loam; 0 to 8 inches thick.

6 to 28 inches, red or brownish-red strongly plastic clay; 12 to 24 inches thick.

28 to 46 inches, brownish-red plastic clay spotted with yellow; 8 to 24 inches thick.

46 inches +, brownish-red sandy clay with thin layers of bluish-gray clay.

A considerable part of the original surface soil has been eroded away. Mixing of subsoil with original surface soil has made a plow layer variable in texture and color. Small severely eroded spots are common and very conspicuous.

Soils of this complex are low in organic matter and plant nutrients and very strongly acid. They are only slightly permeable. External drainage is moderate, but internal drainage is slow. The water-holding capacity is low. Small sandstone fragments and, locally, small pebbles are common on the surface and throughout the soils.

Present use and management.—The eroded rolling phases of Shubuta-Luverne clay loams have been cleared and cropped, but only a very small part is now in cultivation. A small acreage is in unimproved pasture, but most of the acreage is idle or has reverted to wasteland. Yields of crops and pasture are very low.

Use and management requirements.—Poor tilth, low fertility, low water-holding capacity, and susceptibility to erosion make this complex not suitable or, at best, only poorly suitable for crops. The soils are not naturally productive of pasture, and they respond poorly to fertilization. Pastures are relatively difficult to establish and maintain. If the soils are used for pasture, the mixture seeded should include drought-resistant grasses and legumes. Liberal applications of lime, phosphate, and nitrogen are necessary. The nitrogen needed may be supplied by legumes in the pasture mixture, but some commercial nitrogen fertilizer may be required to establish the stand.

Shubuta-Savannah fine sandy loams, rolling phases (5-12% slopes) (Sr).—This complex consists of intricately associated areas of Shubuta fine sandy loam, rolling phase, and Savannah fine sandy loam, rolling phase. It occurs on narrow ridge crests in the highly dissected Coastal Plain sections in the Ruston-Cuthbert-Savannah and the Safford-Cuthbert-Ruston soil association. The Shubuta soil makes up about 60 percent of the complex. Some small areas of Cuthbert soils are also included in the complex. All of these soils have developed from Coastal Plain materials. They have a deciduous forest cover.

Profile description :

Shubuta fine sandy loam, rolling phase :

0 to 8 inches, grayish-yellow loose fine sandy loam ; 6 to 10 inches thick.

8 to 24 inches, yellowish-red to reddish-yellow plastic clay ; 14 to 20 inches thick.

24 to 40 inches, plastic sandy clay highly mottled with red, yellow, and gray ; 10 to 20 inches thick.

40 inches +, reddish-yellow sandy clay with thin platelike layers of bluish-gray clay.

Savannah fine sandy loam, rolling phase :

0 to 8 inches, grayish-yellow very friable loam to fine sandy loam ; 6 to 10 inches thick.

8 to 28 inches, yellowish-brown to brownish-yellow friable clay loam ; 18 to 24 inches thick.

28 to 40 inches (hardpan) compact sandy clay loam or clay loam mottled with gray, yellow, and brown ; 8 to 16 inches thick.

40 inches +, yellowish-brown to reddish-brown sandy clay loam streaked and splotched with gray and yellow ; 1 to 4 feet thick.

These soils are low in organic matter and plant nutrients and strongly to very strongly acid. External drainage is moderate, but internal drainage is moderately slow. The water-holding capacity is low. Some small sandstone fragments and small pebbles are on the surface and throughout these soils in many places.

Present use and management.—Practically all of this complex is wooded, chiefly with post and blackjack oaks and pignut hickory, but also with some white and red oaks. The timber on most areas is small, and little of it is marketable. The trees grow very slowly.

Use and management requirements.—This complex is poorly suited to crops. The soils are physically suitable for crops, but low in fertility and water-holding capacity, and consequently low in productivity. They occur on narrow winding ridge crests associated with soils unsuitable for crops. In most places they cannot be used economically for crops or pasture. They are poor forest soils, but on many farms forest is probably their best use.

Shubuta-Savannah clay loams, eroded rolling phases (5-12% slopes) (So).—This complex consists of areas of Shubuta clay loam, eroded rolling phase, and Savannah clay loam, eroded rolling phase, so intricately associated that separate mapping is not feasible. The soils occur on narrow ridge crests in the highly dissected parts of the Coastal Plain section, or on ridge slopes in the less dissected part. Shubuta soils make up about 60 percent of the complex. Some small areas of Cuthbert and Dulac soils are also included. The soils have developed from Coastal Plain sand and clay.

Profile descriptions:**Shubuta clay loam, eroded rolling phase:**

- 0 to 6 inches, grayish-yellow to reddish-yellow friable clay loam; 0 to 8 inches thick.
- 6 to 22 inches, yellowish-red to reddish-yellow plastic clay; 14 to 20 inches thick.
- 22 to 38 inches, plastic sandy clay highly mottled with red, yellow, and gray; 10 to 20 inches thick.
- 38 inches +, reddish-yellow sandy clay with thin platelike layers of bluish-gray clay.

Savannah fine sandy loam, eroded rolling phase:

- 0 to 6 inches, grayish-yellow to brownish-yellow friable fine sandy loam to clay loam; 0 to 8 inches thick.
- 6 to 26 inches, yellowish-brown to brownish-yellow friable clay loam; 18 to 24 inches thick.
- 26 to 38 inches (hardpan) compact fine sandy loam to clay loam mottled with gray, yellow, and brown; 8 to 16 inches thick.
- 38 inches +, yellowish-brown to reddish-brown sandy clay loam streaked and spotted with gray and yellow; 1 to 4 feet thick.

Substantial parts of the original surface soils have been lost through erosion. The parts remaining have been mixed with the subsoils to form present surface layers that vary in both color and texture. Small severely eroded spots exposing the subsoil are common.

These soils are low in organic matter and plant nutrients and very strongly acid. External drainage is moderate, and internal drainage is moderately slow. The water-holding capacity is low. Some small sandstone fragments and small pebbles have accumulated on the surface in places.

Present use and management.—All of this complex has been cleared and used for crops or pasture, but now most of it is idle land or wasteland. A small acreage is in crops and pasture, but yields from both are extremely low.

Use and management requirements.—The soils of this complex are very poorly suited to crops and poorly suited to pasture. They are low in fertility and water-holding capacity and, consequently, low in productivity. They respond very poorly to improved management. Farmers wishing to establish pastures will have to apply fertilizers and lime. Phosphate, nitrogen, and possibly potash will be needed. After pastures are established, legumes in the mixture seeded will probably supply enough nitrogen. Some nitrogen fertilizer will likely be needed to establish the stand. Grazing should be carefully controlled in order to keep a good sod on the soils and prevent further erosion.

Shubuta-Savannah clay loams, severely eroded rolling phases (5–12% slopes) (Sr).—This complex consists of intricately associated areas of Shubuta clay loam, severely eroded rolling phase, and Savannah clay loam, severely eroded rolling phase, and some small areas of Cuthbert and Dulac soils. It occurs on narrow ridge crests in highly dissected areas and on ridge slopes in the less dissected parts of the Coastal Plain section. The largest areas are in the vicinity of Bear Creek Church just west of Parsons. These soils have developed from the Coastal Plain sand and clay.

Profile descriptions:

Shubuta clay loam, severely eroded rolling phase:

- 0 to 4 inches, reddish-yellow to grayish-yellow moderately friable clay loam; 0 to 6 inches thick.
- 4 to 20 inches, yellowish-red to reddish-yellow plastic clay; 14 to 20 inches thick.
- 20 to 36 inches, plastic sandy clay highly mottled with red, yellow, and gray; 10 to 20 inches thick.
- 36 inches +, reddish-yellow sandy clay with thin platelike layers of bluish-gray clay.

Savannah clay loam, severely eroded rolling phase:

- 0 to 4 inches, grayish-yellow to brownish-yellow friable clay loam; 0 to 6 inches thick.
- 4 to 24 inches, yellowish-brown to brownish-yellow friable clay loam; 18 to 24 inches thick.
- 24 to 36 inches (hardpan) compact fine sandy loam to clay loam mottled with gray, yellow, and brown; 8 to 16 inches thick.
- 36 inches +, yellowish-brown to reddish-brown sandy clay loam streaked and splotched with gray and yellow; 1 to 4 feet thick.

The soils of this complex are severely eroded; most of the original surface soil and, in places, a part of the subsoil have been lost. The present surface layer is heavier textured because subsoil has mixed with it in the plow layer. Shallow gullies are common.

The soils are very low in organic matter and plant nutrients and very strongly acid. External drainage is moderately rapid, but internal drainage is moderately slow to slow. The water-holding capacity is low to very low. Small sandstone fragments and small pebbles have accumulated on the surface in many places.

Present use and management.—All of this complex has been used for crops and pasture, but most of it is now idle land or wasteland. In many places, after the soils are abandoned, not enough wild vegetation grows to stop accelerated erosion.

Use and management requirements.—The soils of this complex are not suitable for crops and very poorly suitable for pasture. On most farms they are probably best used for woodland. These are poor forest soils, however, and reforestation will be very difficult.

Susquehanna very fine sandy loam (5–12% slopes) (Ss).—This extremely heavy textured shallow upland soil is derived from Coastal Plain clays. Its very small areas occur throughout the Coastal Plain section, most of them near Scotts Hill. Closely associated with this soil are the Cuthbert, Tippah, Shubuta, and Dulac soils. The deciduous forest under which this soil developed consists of blackjack, post, and red oaks.

Profile description:

- 0 to 6 inches, gray or yellowish-gray friable very fine sandy loam; 4 to 8 inches thick.
- 6 to 16 inches, reddish-yellow very strongly plastic heavy clay mottled with red, yellow, and gray and containing partly weathered bluish-gray clay aggregates; 6 to 12 inches thick.
- 16 inches +, unweathered bluish-gray clay or almost black carbonaceous clay.

This soil is very strongly acid, low in organic matter, and very low in plant nutrients and water-holding capacity. It is very slightly permeable and very poorly aerated. Roots penetrate only a few

inches. It is relatively free of stones or gravel, though small sandstone fragments lie on the surface in places.

Most of this soil is uneroded, but a fairly large acreage is included that has 12- to 30-percent slopes. Some of these steeper included areas have been cleared and are eroded.

Present use and management.—Most of Susquehanna very fine sandy loam is still wooded, chiefly with blackjack and post oaks, which grow very slowly and produce little marketable timber. Practically all of the cleared areas are idle land or wasteland. The very small acreage used for crops and pasture produces extremely low yields.

Use and management requirements.—This soil is physically unsuitable for either crops or pasture, or, at best, only very poorly suitable for them. It is highly susceptible to erosion and low to very low in plant nutrients and water-holding capacity; consequently, its productivity is very low. It is very poorly suited to use as woodland, but on many farms is probably best used for that purpose. Reforestation of cleared areas will be extremely difficult.

Taft silt loam (1-3% slopes) (TA).—This imperfectly drained soil occurs on low terraces of the Tennessee River in the Huntington-Egam-Wolftever soil association, in some areas on high terraces in the Pickwick-Paden-Etowah soil association, and on low stream terraces in the Bodine-Ennis-Humphreys soil association. The Wolftever, Robertsville, Pickwick, Paden, Humphreys, Lindside, and Melvin are closely associated soils.

The old alluvium from which the soil has formed washed from upland soils underlain by a wide variety of rocks. Material from soils underlain by limestone apparently predominates. On the high terraces the alluvium is covered with a thin layer of loess or loesslike silt. The soil is on nearly level to gently sloping areas. The deciduous forest has a high proportion of water-tolerant trees.

Profile description:

- 0 to 8 inches, gray to yellowish-gray mellow silt loam; 6 to 12 inches thick.
- 8 to 22 inches, pale-yellow friable silty clay loam spotted with gray below about 15 inches; 10 to 16 inches thick.
- 22 to 42 inches (siltpan) very compact silt loam to silty clay loam highly mottled with gray, yellow, and brown; 16 to 24 inches thick.
- 42 inches +, yellowish-brown heavy silty clay loam spotted with yellow and gray; 2 to 10 feet thick.

Taft silt loam varies considerably in profile characteristics. On many of the low Tennessee River terraces it has a brownish-gray surface soil and a profile heavier throughout than that described. On the low terraces of the small streams considerable gravel may be in the profile and the siltpan is missing or only weakly developed. Use and management requirements of these variations do not differ significantly from those of the soil described.

Taft silt loam is strongly to very strongly acid and low in organic matter and in plant nutrients. External drainage is very slow to moderate, and internal drainage is slow. The surface soil and subsoil are permeable; the siltpan is relatively impermeable. The water table is at or near the surface in rainy seasons, especially during winter and early in spring. The water-holding capacity is low. The soil is free of stones or gravel in most places, but it occurs along the streams

in the cherty Limestone Hills section and therefore may contain considerable water-worn chert throughout its profile. Numerous concretions occur in the subsoil and siltpan in many places.

Present use and management.—Taft silt loam is used and managed like the adjoining Paden or Wolftever soils in most places. A larger part is forested, and probably a slightly larger part is idle. About 172 acres are now covered by the Kentucky Reservoir. The forests consist of sweetgum, blackgum, beech, ash, hickory, and willow oak. Crops fail more frequently and yield considerably less on this soil than on adjacent better drained soils. Areas large enough to be used as a unit are usually selected for water-tolerant crops. In such areas corn, lespedeza, soybeans, and sorghum are the principal crops. Under prevailing management average acre yields are 15 bushels of corn and 0.7 ton of lespedeza hay.

Use and management requirements.—The suitability of Taft silt loam is limited by imperfect drainage. Corn, soybeans, lespedeza, white clover, alsike clover, and redtop are among the crops that grow successfully on it. In many places the construction of open ditches would improve surface drainage and should broaden use suitability. Tile drains ordinarily are not practical.

The soil is physically suited to short rotations, but because of the limited variety of crops that can be grown, can be used in many places to good advantage for long rotations. It is low in lime and most plant nutrients, and management is concerned with supplying these elements as cheaply and effectively as possible. Nitrogen probably is best supplied by growing a legume in the rotation and following intertilled crops with a legume cover crop to be turned under. Lime, phosphate, and possibly potash are needed for the legume crop for best results. All crops need phosphate. The need for potash depends on the crop grown and previous treatment of the soil. Under good management expectable yields are 35 bushels of corn and 1.4 tons of lespedeza hay.

Talbott silt loam, rolling phase (5-12% slopes) (Tc).—Areas of this well-drained upland soil are widely distributed throughout the southeastern part of the county. They are largely confined to the Talbott-Emory-Lindside soil association and are closely associated with the stony land types and with Maury, Inman, Bodine, Emory, and Lindside soils. The soil has developed from clayey limestone residuum under a forest cover that is predominantly deciduous but contains many cedar trees.

Profile description :

- 0 to 8 inches, grayish-brown friable silt loam to silty clay loam; 6 to 10 inches thick.
- 8 to 24 inches, yellowish-red to reddish-yellow strongly plastic silty clay that has a well-developed medium nut structure; 12 to 24 inches thick.
- 24 inches +, reddish-yellow very strongly plastic silty clay splotched with gray and yellow; bedrock at 3 to 5 feet.

This soil is medium to strongly acid and has a moderately high content of plant nutrients and organic matter. External drainage is moderate but internal drainage is moderately slow. Small flaggy slabs of limestone are on the surface, and bedrock crops out in places. Clayey limestone bedrock is at a depth of 3 to 5 feet in most places,

but the rock floor is uneven and the bedrock may be at a depth of as much as 10 feet in some places. Loose chert has rolled onto this soil from the higher lying Bodine soils in many places.

As the soil is mapped in this county, its subsoil varies from reddish yellow to dark red or almost purple. The purplish color is inherited from the purple parent rock. The variation having the purplish subsoil does not differ significantly in other characteristics from the soil described. In many places the parent material has been considerably influenced by a small admixture of loess. In such places the surface layer is lighter in color and texture and the upper part of the subsoil is more friable and more permeable. A few small slightly eroded areas have been included. About 10 percent of the soils included have 2- to 5-percent slopes.

Present use and management.—Most of Talbott silt loam, rolling phase, is still in forest consisting mainly of red and white oaks, cedar, and hickory. Most of this forest has been cut over; the present stand is small and includes many culls. Timber grows moderately rapidly and is of good quality.

Use and management requirements.—This soil is physically suited to crops and pasture, but on many farms clearing and cultivating are not feasible because it occurs in small areas associated with stony land types. It is fairly well suited to corn, lespedeza, cotton, and most common field crops and well suited to alfalfa, sweetclover, and red clover. Where the soil has been cleared management should be concerned with improving tilth and moisture conditions, preventing erosion, and increasing the supply of organic matter, nitrogen, lime, phosphorus, and potash. Use and management practices will be similar to those for Talbott silty clay loam, eroded rolling phase.

Talbott silt loam, hilly phase (12–30% slopes) (TB).—This phase is distributed throughout the eastern and southern parts of the county in association with Bodine and Maury soils and other Talbott soils, and with the stony land types. It differs from the rolling phase chiefly in having a steeper slope. It is well-drained and has developed from clayey limestone residuum. The forest cover consists chiefly of deciduous trees but includes some cedar.

Profile description :

- 0 to 8 inches, grayish-brown friable silt loam to silty clay loam; 6 to 12 inches thick.
- 8 to 24 inches, yellowish-red to reddish-yellow strongly plastic silty clay; 12 to 24 inches thick.
- 24 inches +, reddish-yellow very strongly plastic silty clay splotted with gray and yellow; bedrock at depths of 2 to 5 feet.

The soil is medium to strongly acid and moderately high in organic matter and plant nutrients. External drainage is rapid; internal drainage, moderately slow. Small flaggy limestone fragments and loose chert are on the surface in many places. Bedrock outcrops occur occasionally.

Present use and management.—Practically all of Talbott silt loam, hilly phase, is forested with red and white oaks, hickory, and cedar. The trees grow moderately rapidly, but the forest is cut over frequently. The stand is now small and includes many cull or weed trees.

Use and management requirements.—Strong slopes and susceptibility to erosion make this soil very poorly suited to crops. Good

pastures can be established and maintained, but if this soil is to be used for pasture, it should be seeded to a good mixture soon after it is cleared. Lime, phosphate, and possibly potash are needed to maintain highly productive pastures. Grazing should be carefully controlled so as to maintain a good sod at all times. On many farms this soil may be best used for forests. In many places it is on lower slopes below steep Bodine soils, and the runoff it receives from the upper slopes increases the difficulty of controlling erosion.

Talbott silty clay loam, eroded rolling phase (5-12% slopes) (TE).—This well-drained upland soil is widely distributed throughout the southeastern part of the county, but it is confined chiefly to the Talbott-Emory-Lindside soil association. Closely associated with it are the stony land types, Maury, Inman, and Bodine soils, and other Talbott soils. The soil has developed from clayey limestone residuum under a predominantly deciduous forest cover that included some cedar trees.

Profile description:

- 0 to 6 inches, grayish-brown to reddish-yellow moderately friable silty clay loam; 0 to 8 inches thick.
- 6 to 22 inches, yellowish-red to reddish-yellow strongly plastic silty clay; well-developed medium nut structure; 12 to 24 inches thick.
- 22 inches +, reddish-yellow very strongly plastic silty clay spotted with gray and yellow; bedrock at 3 to 5 feet in most places.

A considerable part of the original surface soil has been eroded away. Subsoil has been mixed with the remnants of the original surface soil during tillage to form a present surface layer heavier textured and more variable in color than the original. Small severely eroded spots that have lost all the surface soil are common.

The soil is strongly acid, moderately low in organic matter, and moderate in content of most plant nutrients. External drainage is moderate to moderately rapid, and internal drainage is moderately slow. Some small flaggy slabs of limestone are on the surface, and bedrock outcrops are fairly common. The depth to bedrock varies but probably averages about 5 feet. Loose chert fragments are on the surface on many slopes below the Bodine soils.

A considerable acreage included in this phase has a dark-red (purplish) subsoil but in other characteristics does not differ significantly from the soil described. Some areas of included soils are derived from parent materials that contain a small admixture of loess. These are more friable and more permeable than the other included areas and the soil described.

Present use and management.—The greater part of Talbott silty clay loam, eroded rolling phase, is cropped, but a considerable acreage is idle, and a small area is in pasture. Corn, cotton, and lespedeza are the principal crops; cowpeas, sweetpotatoes, peanuts, and similar crops are planted to limited extent. An estimated 25 percent of the soil is in corn, 10 percent in cotton, 10 percent in miscellaneous crops, and 30 percent in hay and pasture; 25 percent is idle land or wasteland. Crops are not systematically rotated. Small quantities of fertilizer are used on the cotton, and some lime and phosphate have been used on the hay crop recently. Under ordinary management acre yields are 20 bushels of corn, 220 pounds of cotton, and 0.9 ton of lespedeza hay.

Use and management requirements.—Tightness and impaired subsoil permeability greatly decrease the value of this soil for crops. Absorption and percolation of water are retarded, and the alternate extreme wetness and dryness of the surface soil results in severe injury to crops. Because a limited amount of water is absorbed, runoff increases, particularly during heavy rainfall. Restricted absorption, probably more than any other factor, accounts for the erodibility of this soil.

This phase is considered best suited to hay and pasture crops, but under careful management it can be conserved under a rotation that includes intertilled crops once in 5 or 6 years. Alfalfa, sweetclover, red clover, and all common crops of the county can be grown successfully.

The management this soil requires is exacting. It is highly susceptible to erosion; therefore, long rotations that include close-growing crops, especially grasses and legumes, should be used much of the time. Growing of grasses and legumes is necessary to maintain a fairly good tilth. Alfalfa, sericea, sweetclover, and other deep-rooted crops should be grown periodically to improve the permeability of the subsoil. Do not cultivate when the soil is very wet or dry. Tillage should be on the contour, or if this is not practical, the rotation should be lengthened. Terracing or other engineering measures may help control runoff and erosion, but considering the unfavorable consistence of the subsoil, building terraces and maintaining them for a period of years would be of doubtful value. It is especially important that cover crops be kept on the soil during winter.

Fertilizer is required for continued high yields of most crops. Deep-rooted legumes need lime and phosphate and possibly potash. Phosphate is needed for high yields of all crops. All crops except legumes and those immediately following legumes need nitrogen. Under good management expectable acre yields are 35 bushels of corn, 360 pounds of cotton, and 1.4 tons of lespedeza hay.

Talbott silty clay loam, severely eroded rolling phase (5–12% slopes) (T_H).—This severely eroded well-drained upland soil has developed from clayey limestone. It is widely distributed throughout the southeastern part of the county, largely in the Talbott-Emory-Lindside soil association. Closely associated with it are the stony land types; Maury, Inman, and Bodine soils; and other Talbott soils.

Profile description:

- 0 to 4 inches, grayish-brown, reddish-yellow, or yellowish-red moderately plastic silty clay loam; 0 to 6 inches thick.
- 4 to 20 inches, yellowish-red to reddish-yellow strongly plastic silty clay that has a well-developed medium nut structure; 12 to 24 inches thick.
- 20 inches +, reddish-yellow very strongly plastic silty clay spotted with gray and yellow. Bedrock is at depths of 3 to 5 feet in most places.

Most of the original surface layer and, in many places, part of the subsoil have been eroded from this soil. The plow layer now consists largely of subsoil material. Shallow gullies are common. Some of the original surface soil remains on the intergully areas.

This soil is strongly acid, low in organic matter, and moderately low in many plant nutrients. External drainage is moderately rapid,

but internal drainage is moderately slow. Some flaggy limestone fragments and loose chert are on the surface in many places. Bed-rock crops out in places.

Present use and management.—All of the severely eroded rolling phase of Talbott silty clay loam has been cropped, but the greater part is now lying idle. Some of the phase is still used for crops, and some for pasture. Yields are generally low. The present eroded condition indicates that use and management were not adjusted to the physical limitations of the soil.

Use and management requirements.—Chiefly because it is more eroded, this soil is much inferior to Talbott silt loam, rolling phase, and Talbott silty clay loam, eroded rolling phase, for crops. The tilth is especially unfavorable. The soil is highly susceptible to puddling and clodding, and has a narrow range of moisture content at which it can be tilled safely. A relatively hard crust tends to form on the surface when the soil dries after heavy rains. Sprouts of alfalfa, red clover, and other plants sometimes have great difficulty breaking through the crust; this is one of the most important factors responsible for difficulties encountered in establishing many crops. When the soil becomes very dry it generally also becomes very hard and cloddy and develops deep cracks, some of which are as wide as half an inch. The original surface soil had a fairly high water-holding capacity, but most of it is gone. The heavy subsoil retards downward penetration of roots and water, so runoff greatly increases, especially after heavy rains, and makes effective control of erosion difficult.

In its present condition this soil is physically better suited to pasture, or more or less permanent hay, than to tilled crops. After an extended period in hay or pasture it would probably again become suitable for cultivated crops if management were good. The growing of fibrous-rooted crops such as grasses or alfalfa, sweetclover, and other deep-rooted crops should be especially beneficial. The roots of such crops favorably affect the physical condition of the soil. Lime, phosphate, and possibly potash will be needed to establish and maintain good pastures. A good sod-forming pasture mixture that includes legumes should be used. Grazing should be carefully controlled, especially when moisture conditions are adverse.

Talbott silty clay loam, eroded undulating phase (2-5% slopes) (Tf).—Most of this well-drained upland soil is in the Talbott-Emory-Lindside soil association. Its small areas are associated chiefly with other Talbott soils and stony land types. The soil has developed from clayey limestone residuum and differs from Talbott silty clay loam, eroded rolling phase, chiefly in having milder slopes.

Profile description:

- 0 to 6 inches, grayish-brown to reddish-yellow moderately friable silty clay loam; 0 to 8 inches thick.
- 6 to 28 inches, yellowish-red to reddish-yellow plastic silty clay; 16 to 26 inches thick.
- 28 inches +, reddish-yellow very strongly plastic silty clay spotted with gray and yellow; bedrock is at a depth of about 5 feet in most places.

Accelerated erosion has removed a considerable part of the original surface soil. Remnants of the original surface soil have been mixed

with the subsoil during tillage to form a present surface layer heavier textured and more variable in color than the original. Small severely eroded spots exposing the subsoil are common and conspicuous.

This soil is strongly acid, moderately low in organic matter, and moderate in content of plant nutrients. External drainage is moderate, and internal drainage is moderately slow. Some loose limestone and chert fragments are on the surface in many places. Bedrock outcrops are not common.

Present use and management.—All of Talbott silty clay loam, eroded undulating phase, is cleared and has been used for crops or pasture. About 30 percent of it is in corn, 15 percent in cotton, 25 percent in hay and pasture, and 10 percent in miscellaneous crops. Approximately 20 percent is idle land or wasteland. Crops are not systematically rotated. Fertilization is not a common practice, though some fertilizer is used, generally on the cotton crop. Under ordinary management corn yields 22 bushels an acre; cotton, 240 pounds; and lespedeza hay, 1 ton.

Use and management requirements.—This soil has physical properties making it suitable for all of the common crops of the county; it is better suited to deep-rooted legumes than most of the upland soils. It is similar to the eroded rolling phase in use and management requirements but less susceptible to erosion. The rotation presumably can be shorter and include more intertilled crops. Probably the soil can be maintained under a rotation that includes a row crop once in 4 years. Under good management expectable acre yields are 45 bushels of corn, 400 pounds of cotton, and 1.5 tons of lespedeza hay.

Talbott silty clay loam, eroded hilly phase (12–30% slopes) (Tb).—This eroded well-drained soil is widely distributed throughout the eastern and southern parts of the county, largely in association with Bodine, Maury, and Inman soils and other Talbott soils. It developed from clayey limestone residuum and differs from Talbott silt loam, hilly phase, chiefly in being eroded.

Profile description :

- 0 to 6 inches, grayish-brown to reddish-yellow moderately friable silty clay loam; 0 to 8 inches thick.
- 6 to 22 inches, yellowish-red to reddish-yellow strongly plastic silty clay; 12 to 24 inches thick.
- 22 inches +, reddish-yellow very strongly plastic silty clay spotted with gray and yellow. Bedrock is at depths of 2 to 5 feet.

A considerable part of the original surface soil has been lost as a result of erosion. Plowing has mixed the subsoil with remnants of the original surface soil to form a present surface layer heavier textured and more variable in color than the original. Small severely eroded spots that have lost all the surface soil are common.

The soil is strongly acid, moderately low in organic matter, and medium in content of plant nutrients. External drainage is rapid, and internal drainage is moderately slow. Small flaggy limestone fragments and loose chert are on the surface in many places. An occasional bedrock outcrop is to be expected.

Present use and management.—All areas of Talbott silty clay loam, eroded hilly phase, have been cleared and used for crops or pasture. In most places the soil is cleared and cultivated for only a few years and then abandoned or used for unimproved pasture. Now, an esti-

mated 40 percent is idle land or wasteland; 10 percent is used for corn, 5 percent for cotton, 35 percent for hay or pasture, and 10 percent for miscellaneous crops. Crop and pasture yields are low under present management.

Use and management requirements.—This soil is very poorly suited to crops requiring tillage, chiefly because of its strong slopes, eroded condition, and susceptibility to further erosion. On most farms it is probably best used for pasture or semipermanent hay. To establish a good pasture sod that will control erosion, fertilization will be needed in most places. Lime, phosphate, and possibly potash also will be needed. A sod-forming pasture mixture that includes legumes should be seeded. Nitrogen may be needed to establish the stand, but after the pasture is once established, legumes in the mixture should supply adequate nitrogen. Grazing will need to be controlled carefully so as to maintain a good sod at all times.

Talbott silty clay loam, severely eroded hilly phase (12–30% slopes) (Tg).—Areas of this severely eroded well-drained upland soil are distributed throughout the eastern and southern parts of the county; most of them are confined to the Talbott-Emory-Lindside soil association. Bodine and Maury soils, other Talbott soils, and stony land types are its close associates. The soil developed from clayey limestone residuum. It differs from the eroded hilly phase chiefly in having lost more of its surface layer through erosion. Most of the surface layer is gone, and part of the subsoil is missing. Shallow gullies are common.

Profile description :

- 0 to 4 inches, grayish-brown, reddish-yellow, or yellowish-red moderately plastic silty clay loam; 0 to 6 inches thick.
- 4 to 20 inches, yellowish-red to reddish-yellow strongly plastic silty clay; 12 to 24 inches thick.
- 20 inches +, reddish-yellow very strongly plastic silty clay spotted with gray and yellow; bedrock at depths of 2 to 5 feet in most places.

The soil is strongly acid and low in organic matter and plant nutrients. External drainage is rapid to very rapid, and internal drainage is moderately slow. Small flaggy limestone fragments and chert fragments are on the surface in many places. Bedrock crops out in places.

Present use and management.—All of Talbott silty clay loam, severely eroded hilly phase, is cleared and has been used for crops and pasture. Most of it, however, is abandoned. Some areas are in unimproved pastures, but little of the soil is used for crops. Crops and pastures produce low yields. A volunteer stand of cedar grows on many abandoned areas.

Use and management requirements.—This soil has been severely eroded; its fertility and water-holding capacity have been lowered so much that productivity is low. Tilth has been seriously impaired, and the range in moisture content that permits safe tillage is narrow. Water is absorbed slowly; runoff is very rapid; and erosion is extremely difficult to control. On most farms this soil is probably best used as woodland. If it is used for pasture, management should be similar to that for the eroded hilly phase, but more advanced preparation, as building check dams in the gullies and mulching galled spots, will be needed before pasture can be established. This phase will also require heavier fertilization.

Talbott stony silt loam, rolling phase (5-12% slopes) (T_L).—This well-drained upland soil is widely distributed in the southern and southeastern parts of the county. It is confined largely to the Talbott-Emory-Lindsay soil association. Closely associated with it are the stony land types; Bodine, Maury, and Inman soils; and other Talbott soils.

The soil has developed from clayey limestone residuum and is characterized by bedrock outcrops or loose stone. It differs from Talbott silt loam, rolling phase, chiefly in having more bedrock outcrops, but also the underlying bedrock is nearer the surface and the surface soil and subsoil layers are generally thinner.

Profile description :

0 to 8 inches, grayish-brown friable silt loam to silty clay loam; 4 to 10 inches thick.

8 to 24 inches, yellowish-red to reddish-yellow strongly to very strongly plastic silty clay; 8 to 24 inches thick.

24 inches +, reddish-yellow very strongly plastic silty clay spotted with gray and yellow; bedrock at a depth of 2 to 4 feet in most places.

The soil is medium to strongly acid and moderately high in organic matter and plant nutrients. External drainage is moderate, but internal drainage is moderately slow. The water-holding capacity is moderately low. The depth to bedrock is extremely variable. Bedrock outcrops materially interfere with cultivation. Loose limestone and chert fragments are on the surface in many places.

Present use and management.—Practically all of Talbott stony silt loam, rolling phase, is forested, mainly with cedar but also with many white and red oaks, hickory, and other deciduous trees. Most of the forest has been cut over recently; consequently, the stand is small and includes many culls. The trees grow moderately rapidly.

Use and management requirements.—This soil is physically suited to crops and pastures but it occurs in small areas associated with stony land types that cannot feasibly be cleared and cultivated on many farms. In use suitability and management requirements the soil is similar to Talbott silt loam, rolling phase, but stoniness makes it less desirable for either crops or pasture. The stones covering a considerable part of the surface interfere with tillage and weed eradication in pastures. The water-holding capacity is also less than for the rolling phase; consequently, crops are more subject to injury from droughts.

Talbott stony silt loam, hilly phase (12-30% slopes). (T_H).—This extensive upland soil is widely distributed in relatively large areas throughout the eastern and southern parts of the county. In most places it occurs on lower ridge slopes below cherty Bodine soils. It has developed from the clayey limestone residuum and differs from Talbott silt loam, hilly phase, chiefly in being more stony. Bedrock outcrops and loose stones interfere materially with cultivation. The forest cover is predominantly cedar.

Profile description :

0 to 8 inches, grayish-brown friable silt loam to silty clay loam; 4 to 10 inches thick.

8 to 24 inches, yellowish-red to reddish-yellow strongly to very strongly plastic silty clay; 8 to 20 inches thick.

24 inches +, reddish-yellow very strongly plastic silty clay spotted with gray and yellow; bedrock at a depth of 2 to 4 feet in most places.

The soil is medium to strongly acid and moderately high in organic matter and plant nutrients. External drainage is rapid, but internal drainage is moderately slow. The water-holding capacity is moderately low. The depth to bedrock varies. Bedrock outcrops are common, and loose limestone and chert fragments are on the surface in most places. The chert has washed from the higher lying Bodine soils.

Present use and management.—Practically all of the hilly phase of Talbott stony silt loam is in forest consisting of cedar, white and red oaks, and hickory. Most of the forest has been cut over a number of times, so the present stand is small and includes many culls. Tree growth is moderately rapid.

Use and management requirements.—Stoniness, strong slopes, and susceptibility to erosion make this soil generally unsuitable for crops but suitable for pasture. A large acreage on lower ridge slopes below cherty Bodine soils is less well suited to pasture than the rest because runoff from upper slopes makes erosion harder to control and brings considerable chert down over the soil. Pasture management will be similar to that for Talbott silt loam, hilly phase.

Talbott stony silt loam, steep phase (30+ % slopes) (T_M).—Areas of this steep well-drained upland soil are widely distributed throughout the southeastern part of the county, largely in the Talbott-Emory-Lindsay soil association. The soil has developed from clayey limestone residuum. It is relatively shallow and is characterized by bedrock outcrops. It differs from the hilly phase chiefly in having steeper slopes, but it is also more variable in depth to bedrock, stoniness, and development of surface soil and subsoil layers. Development took place under a forest of cedar, red and white oaks, and hickory.

Profile description :

- 0 to 6 inches, grayish-brown friable silt loam to silty clay loam; 4 to 10 inches thick.
- 6 to 22 inches, yellowish-red to reddish-yellow strongly to very strongly plastic silty clay; 8 to 20 inches thick.
- 22 inches +, reddish-yellow very strongly plastic silty clay spotted with gray and yellow; bedrock at depths of 2 to 4 feet in most places.

The soil is medium to strongly acid and moderately high in organic matter and plant nutrients. External drainage is very rapid, but internal drainage is moderately slow. Depth to bedrock varies; bedrock crops out in many places. Some limestone and chert fragments are on the surface in many places.

Present use and management.—Practically all of Talbott stony silt loam, steep phase, is in forest that has been cut over and now consists of a stand of small trees that are growing moderately rapidly.

Use and management requirements.—Steepness, stoniness, and extreme susceptibility to erosion make this soil unsuitable for crops or pasture. On most farms forestry is probably its best use.

Talbott stony silty clay loam, eroded rolling phase (5-12% slopes) (T_O).—Clayey limestone residuum is the material from which this well-drained soil has developed. Areas are widely distributed throughout the southern and eastern parts of the county, most of them in the Talbott-Emory-Lindsay soil association. The soil is relatively shallow, and bedrock outcrops are common. The native forest was predominantly cedar but it included many deciduous trees.

Profile description :

- 0 to 6 inches, grayish-brown to reddish-yellow moderately friable silty clay loam ; 0 to 8 inches thick.
- 6 to 22 inches, yellowish-red to reddish-yellow strongly to very strongly plastic silty clay ; 8 to 24 inches thick.
- 22 inches +, reddish-yellow very strongly plastic silty clay spotted with gray and yellow ; bedrock at a depth of 2 to 4 feet in most places.

A considerable part of the original surface soil has been lost. The present surface layer is a mixture of the remnants of the original surface soil with the upper part of the subsoil. This layer is more variable in color and texture than the original surface soil, and heavier in most places. Small severely eroded spots exposing the subsoil are common and conspicuous.

This soil is strongly acid, moderately low in organic matter, and medium in content of most plant nutrients. External drainage is moderate to moderately rapid ; internal drainage is moderately slow. Small flaggy limestone fragments and chert fragments are on the surface in many places. Bedrock outcrops interfere materially with cultivation (pl. 5, C).

Present use and management.—All of Talbott stony silty clay loam, eroded rolling phase, has been cleared and used for crops or pasture, but most of it is now idle land or wasteland. An estimated 30 to 40 percent is used for crops and pasture. The common crops—corn, cotton, and lespedeza—generally produce low yields, but some fair to good pastures have been established.

Use and management requirements.—On most farms this soil possibly is best used and managed for pasture. It should be seeded to a permanent sod-forming mixture that includes legumes. Lime, phosphate, and possibly nitrogen fertilizers will be needed to establish a good pasture, but once a stand is established, the legumes should supply adequate nitrogen if other fertilizer elements are properly applied. Grazing should be carefully controlled in order to maintain a good sod and aid in keeping down weeds. If this soil is to be used for crops, management practices should be similar to those for Talbott silty clay loam, eroded rolling phase.

Talbott stony silty clay loam, severely eroded rolling phase (5–12% slopes) (Tr).—This stony well-drained soil is distributed throughout the uplands in the southern and eastern parts of the county, largely in the Talbott-Emory-Lindside soil association area. It has developed from clayey limestone residuum.

Profile description :

- 0 to 4 inches, grayish-brown, reddish-yellow, or yellowish-red moderately plastic silty clay loam ; 0 to 6 inches thick.
- 4 to 20 inches, yellowish-red to reddish yellow strongly to very strongly plastic silty clay ; 8 to 24 inches thick.
- 20 inches +, reddish-yellow very strongly plastic silty clay spotted with gray and yellow ; bedrock at a depth of 2 to 4 feet in most places.

This soil is severely eroded ; most of the original surface soil is gone, and, in many places, a part of the subsoil has been lost. The plow layer is largely in subsoil material, though part of the original surface layer remains on some intergully areas. Shallow gullies are common.

The soil is strongly acid, low in organic matter, and moderately low in plant nutrients. External drainage is moderately rapid, but internal drainage is moderately slow. The water-holding capacity

is low. Small limestone and chert fragments lie on the surface in many places. Bedrock outcrops would materially interfere with cultivation if cultivation were otherwise feasible.

Present use and management.—All of Talbott stony silty clay loam, severely eroded rolling phase, has been cleared and used for crops and pasture, but practically all now lies idle or is wasteland. The very small acreage used for crops or pastures produces very low yields.

Use and management requirements.—This soil has been severely injured by erosion; fertility and water-holding capacity have been lowered and tilth properties have been seriously impaired. On most farms the soil is probably best used for pasture, though in its present condition it is not productive of forage plants. Pasture management will be similar to that for Talbott silty clay loam, severely eroded rolling phase, but a good sod will be somewhat more difficult to establish and maintain. Grazing will need to be more carefully controlled. Weed eradication will be more difficult.

Talbott stony silty clay loam, eroded hilly phase (12–30% slopes) (TN).—This stony well-drained upland soil occurs throughout the southeastern part of the county, largely in the Talbott-Emory-Lindside soil association. It has developed from clayey limestone residuum under a forest of cedar, white and red oaks, and hickory.

Profile description :

- 0 to 6 inches, grayish-brown to reddish-yellow moderately friable silty clay loam; 0 to 8 inches thick.
- 6 to 22 inches, yellowish-red to reddish-yellow strongly to very strongly plastic silty clay; 8 to 20 inches thick.
- 22 inches +, reddish-yellow very strongly plastic silty clay spotted with gray and yellow; bedrock at a depth of 2 to 4 feet in most places.

A large part of the original surface soil has been lost as a result of accelerated erosion. The mixing of the upper part of the subsoil with the remnants of the original surface soil has made the present surface layer heavier textured and more variable in color than the original. Small severely eroded spots are common.

The soil is strongly acid, moderately low in organic-matter content, and medium in content of plant nutrients. External drainage is rapid; internal drainage is moderately slow. The water-holding capacity is moderately low. The depth to bedrock varies, and bedrock crops out in many places. Loose limestone and chert fragments are on the surface in many places.

Present use and management.—All of the eroded hilly phase of Talbott stony silty clay loam has been cleared and used for crops and pasture. A part is still used for these purposes, but most of it is left idle or is wasteland. Crop and pasture yields are very low.

Use and management requirements.—Susceptibility to further erosion, strong slopes, stoniness, and poor tilth make this soil unsuitable for crops on most farms. As it is now, the soil is not productive of pasture, but fair to good pastures can be established and maintained on it. Lime, phosphate, and probably nitrogen and potash will be needed to do this, and a good sod-forming pasture mixture that includes legumes should be seeded. Pasture management will be similar to that for Talbott silty clay loam, eroded hilly phase.

Talbott stony silty clay loam, severely eroded hilly phase (12-30% slopes) (T_P).—Numerous bedrock outcrops characterize this severely eroded hilly soil of the uplands. It has developed from clayey limestone residuum and occurs mainly in the Talbott-Emory-Lindsay soil association in the southeastern part of the county.

Profile description:

- 0 to 4 inches, grayish-brown, reddish-yellow, or yellowish-red moderately plastic silty clay loam; 0 to 6 inches thick.
- 4 to 20 inches, yellowish-red to reddish-yellow strongly to very strongly plastic silty clay; 8 to 20 inches thick.
- 20 inches +, reddish-yellow very strongly plastic silty clay spotted with gray and yellow. Bedrock is at a depth of 2 to 4 feet in most places.

Most of the original surface layers and, in places, a part of the sub-soil have been lost as a result of erosion. Small shallow gullies are common, but many intergully areas still have part of the original surface layers. The plow layer consists largely of subsoil material.

The soil is strongly acid and low in organic matter and plant nutrients. External drainage is rapid to very rapid, and internal drainage is moderately slow. The water-holding capacity is low. The depth to bedrock varies; bedrock outcrops are common. Loose limestone and chert fragments lie on the surface in many places.

Present use and management.—All of Talbott stony silty clay loam, severely eroded hilly phase, has been cleared and used for crops, but practically all of it is now idle land or wasteland. The small part used for pasture produces very low yields.

Use and management requirements.—This soil is very poorly suited to either crops or pasture. It is low in plant nutrients and water-holding capacity and difficult to till because of its stoniness and strong slopes. In its present condition it is probably best used as woodland on most farms.

Tigrett silt loam (2-5% slopes) (T_s).—This brown well-drained soil occurs in small areas on gently sloping alluvial fans of small streams emerging onto larger flood plains, on gently sloping areas at the base of upland slopes, and along narrow drainageways. It is widely distributed throughout the colluvial area in the western part of the county, but the largest acreage is in the Loess Plain section. Closely associated with this phase is the Briensburg soil of the colluvial lands, the Shannon soils of the bottom lands, and the Dulac soils of the uplands.

The soil has formed under deciduous forest consisting chiefly of white and red oaks, beech, maple, and sweetgum. The parent material is local alluvium or colluvium lying at the foot of the slopes from which it washed. The alluvium consists chiefly of materials washed from upland soils derived from loess.

Profile description:

- 0 to 12 inches, light-brown or grayish-brown mellow silt loam; in wooded areas the upper 2 or 3 inches stained dark gray with organic matter; 8 to 14 inches thick.
- 12 to 36 inches, brown to yellowish-brown friable silt loam; 12 to 24 inches thick; some gray spots may be below 18 to 24 inches.
- 36 inches +, yellowish-brown friable silt loam spotted with gray and rust brown; 0 to 4 feet thick.

The soil is very permeable throughout and high in water-holding capacity. External and internal drainage are moderate. None of

the soil except that part along the small streams is subject to overflow, and that for only a short period. The soil is strongly to very strongly acid and relatively high in organic matter and plant nutrients.

Present use and management.—Practically all of Tigrett silt loam has been cleared and is used for crops. About 40 percent is used for corn, 20 percent for cotton, 20 percent for hay and pasture, and 10 percent for miscellaneous crops. Some 10 percent is idle open land. Crops are not systematically rotated; fertilization is not commonly practiced. Fair yields are obtained under continuous cropping to corn and cotton. Most farmers use a 200-pound application of 20-percent superphosphate, mixed fertilizer such as 3-9-6 or 4-12-4, or a low-analysis fertilizer for the cotton. Under common management corn yields about 35 bushels an acre; cotton, about 300 pounds.

Use and management requirements.—Tigrett silt loam, one of the most productive soils in the county, is suited to a wide variety of crops. It is well drained, fertile, and high in water-holding capacity; it can be tilled over a fairly wide range of moisture conditions. In most places it receives frequent additions of sediment that aid in maintaining the supply of organic matter and plant nutrients. It is susceptible to loss from erosion in only a few places.

This soil is suited to intensive use and can be kept highly productive in a 3- or 4-year rotation if properly fertilized. Though yields are relatively high without fertilization, a good response can be expected from fertilizer. Lime and phosphate are needed for the legume crop. Most crops should respond well to phosphate, and possibly to potash. Areas that have been cropped intensively should respond well to nitrogen fertilizers or to the use of legumes in the rotation. Under good management expectable yields are 60 bushels an acre of corn, 480 pounds of cotton, and 1.8 tons of lespedeza hay.

Tippah silt loam, rolling phase (5-12% slopes) (Tu).—Small areas of this moderately well drained siltpan soil occur in the uplands in close association with Susquehanna, Cuthbert, and Dulac soils. Although small areas occur in all parts of the Coastal Plain, most of the acreage is in the Loess Plain section southwest of Decaturville and in the vicinity of Bear Creek Church. The soil is underlain by extremely heavy plastic clays; its parent material consists of a loess ranging from about 24 to 42 inches in thickness. The soil developed under a deciduous forest.

Profile description:

- 0 to 8 inches, grayish-yellow to yellowish-gray mellow silt loam; 6 to 10 inches thick.
- 8 to 22 inches, yellowish-brown to brownish-yellow silty clay loam; 12 to 18 inches thick.
- 22 to 42 inches (siltpan) very compact silt loam to heavy silty clay loam highly mottled with gray, yellow, and brown; 12 to 24 inches thick.
- 42 inches +, very strongly plastic clay mottled with gray, yellow, and red; 2 to 5 feet thick.

The soil is strongly to very strongly acid and apparently low in organic matter and plant nutrients. The surface soil and subsoil are permeable to air, roots, and water, but the siltpan and underlying materials are relatively impermeable. The water-holding capacity is low. External drainage is moderate, and internal drainage is moderately slow. The soil is relatively free of any stone or gravel. A

very small acreage included with this phase in mapping has 2 to 5 percent slopes.

Present use and management.—Practically all of Tippah silt loam, rolling phase, is forested, chiefly with blackjack and post oaks. The stand is small, grows very slowly, includes many cull trees, and produces little marketable timber.

Use and management requirements.—This soil is physically suitable for crop or pasture but its low fertility and low water-holding capacity give it low productivity for most crops. The soil responds to good management but is difficult to keep at a high level of productivity. It is highly susceptible to erosion when cleared, so the rotation must be long and consist chiefly of close-growing crops. The management requirements of this soil would be similar to those for dulac silt loam, eroded rolling phase, but its response to good management would be less.

Tippah silt loam, eroded rolling phase (5–12% slopes) (T_T).—This moderately well drained siltpan soil occurs in the uplands. The small areas are closely associated with Susquehanna, Cuthbert, Dulac, Briensburg, Hymon, and Beechy soils. The greater part of the total acreage is in the Dulac-Savannah-Briensburg soil association near Bear Creek Church and southwest of Decaturville. An extremely heavy plastic clay lies beneath the siltpan in this soil. The parent material is a thin layer of loess about 24 to 42 inches thick. The soil has developed under deciduous forest.

Profile description:

- 0 to 6 inches, grayish-yellow to light yellowish-brown friable silt loam; 0 to 8 inches thick.
- 6 to 20 inches, yellowish-brown to brownish-yellow friable silty clay loam; 12 to 18 inches thick.
- 20 to 40 inches, (siltpan) very compact silt loam to heavy silty clay loam highly mottled with gray, yellow, and brown; 12 to 24 inches thick.
- 40 inches +, very strongly plastic clay mottled with gray, yellow, and red; 2 to 5 feet thick.

A considerable part of the original surface layer has been eroded away. Some subsoil has mixed with the original surface soil during tillage but has made the plow layer significantly heavier than the original surface soil only in the more severely eroded areas. Small severely eroded spots are common; these are conspicuous because the subsoil is exposed. This phase includes small areas of Tippah soils on 2 to 5 percent slopes. Also included are a few small wooded areas that are uneroded. The total acreage of these variations and inclusions is small.

The soil is strongly to very strongly acid and apparently low in organic matter and plant nutrients. The surface soil and subsoil are permeable to air, roots, and water, but the siltpan is relatively impermeable. The water-holding capacity is low or very low. External drainage is moderate to moderately rapid, and internal drainage is moderately slow.

Present use and management.—Some Tippah silt loam, eroded rolling phase, is cropped, but the larger part is lying idle. The individual areas average only about 2 acres and are in fields with Dulac soils; consequently, they are used and managed similarly. The soil is apparently more erosive than Dulac silt loam, eroded rolling phase, and where it is under the same management it is more eroded.

Use and management requirements.—Tippah silt loam, eroded rolling phase, is inferior to the Dulac soils for crops or pasture, mainly because it is more susceptible to erosion. The relatively impervious siltpan and substratum layers greatly decrease the soil's ability to absorb water and therefore increase runoff and erosion, particularly during heavy rainfall. The soil is also lower in water-holding capacity, and crops are damaged more often by droughts. Nevertheless, it has favorable tilth and is on slopes that are easily worked. The siltpan retards internal drainage, but drainage is adequate for most crops commonly grown.

The use and management requirements of this soil are similar to those of Dulac silt loam, eroded rolling phase. This soil is more susceptible to erosion, however, and therefore needs a longer crop rotation made up mainly of close-growing crops. Tillage should be on the contour. Terraces are probably needed, but the practicability of building them is questionable. For similar crops, the fertilizer requirements for this soil are the same as for Dulac silt loam, eroded rolling phase, but the response to them will not be so good because less moisture is held in the soil for growing plants.

On most farms this soil is probably best used for pasture, though it is not naturally productive of forage plants. Lime, phosphate, and possibly potash will be needed to establish and maintain even fair pasture. Nitrogen also may be needed to establish the pasture. After the pasture is established, legumes included in the mixture should supply most of the needed nitrogen. Grazing should be carefully controlled in order to maintain a good sod and control erosion.

Tippah silty clay loam, severely eroded rolling phase (5–12% slopes) (Tv).—Small areas of this moderately well drained siltpan soil of the uplands are widely distributed in the Loess Plain section. Closely associated are areas of Susquehanna, Cuthbert, Dulac, Briensburg, and Hymon soils. This soil differs from Tippah silt loam, eroded rolling phase, chiefly in having lost more of its surface layer through erosion. It has developed from a thin loess mantle underlain at 24 to 42 inches by heavy acid clays.

Profile description:

- 0 to 4 inches, grayish-yellow or brownish-yellow friable silty clay loam; 0 to 6 inches thick.
- 4 to 18 inches, yellowish-brown to brownish-yellow friable silty clay loam; 12 to 18 inches thick.
- 18 to 38 inches, (siltpan) very compact heavy silty clay loam highly mottled with gray, yellow, and brown; 12 to 24 inches thick.
- 38 inches +, very strongly plastic silt loam to clay mottled with gray, yellow, and red; 2 to 5 feet thick.

This soil is severely eroded. Most of the original surface layer has been lost, and shallow gullies have penetrated the subsoil in many places. Enough of the subsoil material has been incorporated into the present surface layer to give it a heavier texture in most places. In most places sheet erosion has been less severe than gullying. Closely spaced shallow gullies are characteristic. Much of the original surface soil remains on the intergully areas.

The soil is apparently very low in organic matter, plant nutrients, and water-holding capacity. It is strongly to very strongly acid. The upper layers are permeable to air, roots, and water, but the siltpan

and underlying materials are relatively impermeable. External drainage is moderate to rapid; internal drainage is moderately slow. The water-holding capacity is very low.

Present use and management.—All of Tippah silty clay loam, severely eroded rolling phase, has been cleared and used at some time for crops and pasture, but practically all of it is now idle land or wasteland. The very small acreage used for crops and pasture produces extremely low yields.

Use and management requirements.—This soil has been severely injured by erosion and now has very low productivity for either crops or pasture. Trees are extremely difficult to establish and grow very slowly. Nevertheless, this phase is probably best used as woodland. Considerable advance preparation, such as the building of check dams and diversion ditches and the mulching and fertilization of the soil, will be required before the soil can be reforested.

Waynesboro fine sandy loam (5–30% slopes) (WA).—This intensive well-drained soil lies on old high Tennessee River terraces, chiefly near Utah School and in the Clifton Bend area near Clifton in Wayne County. Closely associated are Bodine, Talbott, and Etowah soils. The soil has developed from extremely old alluvium made up of material washed from soils underlain by a wide variety of rocks, including limestone. Material from soils underlain by sandstone apparently predominates. The soil developed under a deciduous forest.

Profile description :

0 to 8 inches, yellowish-gray loose fine sandy loam ; 6 to 12 inches thick.

8 to 32 inches, light reddish-brown friable fine sandy clay loam ; 20 to 30 inches thick.

32 inches +, light-red or yellowish-red friable sandy clay loam streaked and spotted with yellow and gray ; 1 to 5 feet thick.

The soil is relatively free of gravel but in places it has a few sandstone fragments on the surface. About one-third of its area is eroded, and a small part is severely eroded.

The soil is readily permeable to air, roots, and water. It is moderately low in organic matter, plant nutrients, and water-holding capacity and strongly to very strongly acid. External drainage is moderate to rapid, and internal drainage is moderate.

Present use and management.—Most of Waynesboro fine sandy loam is covered with poorly managed forest consisting chiefly of red and white oaks, hickory, beech, and dogwood. The stand is small, includes a high percentage of cull or weed trees, and grows moderately slowly. The cleared areas are largely wasteland or unimproved pasture.

Use and management requirements.—Waynesboro fine sandy loam is not physically suitable, or at best, very poorly suitable for crops. It is fairly well suited to pasture. The soil is moderate to low in organic matter, plant nutrients, and water-holding capacity and highly susceptible to erosion. Most of the areas are very small and surrounded by soils not suited to crops or pasture. On most farms they are probably best left in forest. Fertilization is necessary to establish and maintain fair pastures. Lime, phosphate, and possibly potash will be needed. Nitrogen is also important, but it should be largely supplied by legumes in the pasture mixture.

Wolftever silt loam (2-5% slopes) (WB).—Fairly large areas of this moderately well drained soil occur on low Tennessee River terraces or along tributary streams influenced by backwater from the Tennessee River. The soil is confined to the Huntington-Egam-Wolftever soil association. It has developed from old mixed alluvium washed from upland soils underlain by a wide variety of rocks, but chiefly by limestone. Soil development took place under a deciduous forest.

Profile description :

0 to 10 inches, brownish-gray to grayish-brown friable silt loam; 8 to 12 inches thick.

10 to 32 inches, yellowish-brown to brownish-yellow slightly compact to compact heavy silty clay loam to silty clay; 15 to 25 inches thick.

32 inches +, brownish-yellow moderately compact silty clay loam; 15 to 25 inches thick.

Wolftever silt loam, as mapped in Decatur county, varies considerably in age and in degree of profile development. The young broad nearly level areas are heavier textured and have a more compact subsoil and lower productivity than the soil in other places. Crops are frequently damaged by droughts on this variation. The Wolftever soils on the older terraces, those that receive overflow only at long intervals, have a surface soil more highly leached and lighter in color and texture; a subsoil lighter in color and texture and more friable; and a weakly developed siltpan in many places. This last-mentioned variation is approaching the Paden soils in age and profile characteristics.

Wolftever silt loam is strongly acid and moderately well supplied with organic matter and plant nutrients. Internal and external drainage are moderately slow. The compact subsoil retards movement of air and water and restricts root penetration. The water-holding capacity is moderately low.

Present use and management.—Nearly a half of Wolftever silt loam, or 183 acres, is covered by the Kentucky Reservoir. Of the rest, approximately 50 to 60 percent is in forest. Corn, cotton, and lespedeza are the principal crops grown on cleared areas. The soil is used like Sequatchie fine sandy loam, but a larger part is idle each year. The crops are not rotated to maintain or increase crop yields. The needs of the farmer largely determine which crop is grown.

Fertilization is commonly practiced only for the cotton crop. About 200 pounds of superphosphate, a mixed fertilizer such as 3-9-6 or 4-12-4, or a mixed low-analysis fertilizer is the common application. Recently some lime and phosphate have been used on lespedeza. Under ordinary management corn yields 25 bushels an acre; cotton, 280 pounds; and lespedeza hay, 1 ton.

Use and management requirements.—Wolftever silt loam is physically suitable for crops and moderately high in fertility. Its compact subsoil and low water-holding capacity usually limit it to only moderate crop yields. Yields vary greatly, depending on the quantity and distribution of rainfall. Susceptibility to flooding also limits use of the soil to some extent. Winter annuals and perennial or biennial crops are not commonly grown, but the infrequent loss of these crops probably should not prohibit their use.

Because this soil has an unfavorable subsoil and substratum consistency its productivity may be more difficult to increase than that

of the associated Sequatchie soils. Considerable response, nevertheless, may be expected from fertilization and from systematic rotation of crops. The rotation can be moderately short but should include a legume, preferably a deep-rooted one. Lime and phosphate are necessary for best results with the legume crop. Nitrogen will be needed for all except the legume crop and the crop immediately following. The need for potash will depend largely on the crop and previous treatment of the soil. The cotton crop will probably need potash in most places.

It is important that the supply of organic matter be maintained or increased. Favorable results can be expected from green manuring or from application of barnyard manure. The growing of grasses with fibrous root systems will tend to increase the supply of organic matter and improve soil tilth. Under good management expectable acre yields are 45 bushels of corn, 480 pounds of cotton, and 1.5 tons of lespezeza hay.

Wolftever silt loam, slightly eroded phase (2-5% slopes) (Wc).—This moderately well drained slightly eroded soil occurs on terraces along the Tennessee River or along tributary streams influenced by backwaters from that river. It is confined to the Huntington-Egam-Wolftever soil association. The mixed alluvium from which soil has formed washed from upland soils that were underlain by a wide variety of rocks, but chiefly by limestone.

Profile description :

- 0 to 8 inches, grayish-brown or light-brown friable silt loam; 4 to 10 inches thick.
- 8 to 30 inches, yellowish-brown to brownish-yellow slightly compact to compact heavy silty clay loam to silty clay; 15 to 25 inches thick.
- 30 inches +, brownish-yellow moderately compact silty clay loam to silty clay spotted with gray and yellow; 2 to 10 feet thick.

This soil is slightly eroded. Its thin dark layer of higher organic matter content has eroded away or been depleted by cropping. Nevertheless, the original surface soil still constitutes the plow layer over the greater part of the mapped areas.

The soil is strongly acid, moderate in plant nutrients, and moderately low in organic matter. Internal and external drainage are moderately slow. The compact subsoil retards movement of air and water and restricts root penetration. The water-holding capacity is moderately low.

Present use and management.—All of Wolftever silt loam, slightly eroded phase, except 204 acres covered by the Kentucky Reservoir is cleared and used for crops—chiefly corn and lespezeza but also some cotton and miscellaneous crops. About 50 percent is used for corn, 30 percent for lespezeza, and 5 percent for cotton; the rest is left idle or used for miscellaneous crops. Crops are not systematically rotated; fertilizer is generally used only for cotton. Under ordinary management corn yields 25 bushels an acre; cotton, 280 pounds; and lespezeza hay, 1 ton.

Use and management requirements.—This soil is physically suitable for crops or pasture but its low water-holding capacity limits it to only moderate yields. Also, yields vary a great deal, depending on the amount of rainfall and the time it comes. Crop yields can be

maintained at a higher level by (1) use of a systematic crop rotation that includes a legume crop and (2) by proper and adequate fertilization. Use and management practices are similar to those for Wolftever silt loam.

Wolftever silty clay loam, eroded phase (2-5% slopes) (W_d).—This eroded moderately well drained soil occurs on low terraces along the Tennessee River or along tributary streams influenced by backwaters of that river. It is confined to the Huntington-Egam-Wolftever soil association. It has developed from old mixed alluvium that washed from upland soils underlain by a wide variety of rocks, but principally by limestone.

Profile description:

- 0 to 6 inches, grayish-brown, light-brown, or yellowish-brown friable silty clay loam or silt loam; 0 to 8 inches thick.
- 6 to 28 inches, yellowish-brown to brownish-yellow slightly compact to compact heavy silty clay loam to silty clay; 15 to 25 inches thick.
- 28 inches +, brownish-yellow moderately compact silty clay loam to silty clay spotted with gray and yellow; 2 to 10 feet thick.

Erosion has removed a considerable part of the original surface soil, including the thin surface layer of higher organic-matter content. In many places a small quantity of subsoil has been mixed with the remaining surface soil to form a plow layer heavier textured than the original surface layer. Included are a few small severely eroded areas; these are conspicuous because so much subsoil is exposed.

The soil is strongly acid and moderately well supplied with organic matter and plant nutrients. External and internal drainage are moderately slow. The compact subsoil restricts movement of air and water and retards root penetration. The water-holding capacity is moderately low.

Present use and management.—All of Wolftever silty clay loam, eroded phase, has been cleared and used for crops. Now, 146 acres are covered by the Kentucky Reservoir. An estimated 35 percent of the soil is used for corn, 15 percent for cotton, 25 percent for lespedeza, and 15 percent for miscellaneous crops. About 10 percent lies idle. Crops are not rotated systematically, nor is fertilization a common practice for all crops. Cotton usually receives a light application of a complete fertilizer, and on some farms lespedeza receives lime and phosphate. Crop yields are decidedly less than on the slightly eroded or uneroded Wolftever soils. Under the ordinary management average acre yields are 18 bushels of corn, 240 pounds of cotton, and 0.8 ton of lespedeza hay.

Use and management requirements.—Erosion has seriously injured this soil. Tilth has been impaired, fertility has been lowered, and moisture supplies available for growing plants have been considerably decreased. The soil tends to bake or become hard and crusted on top; this affects its ability to absorb rainfall, and the result is more injury to crops during droughts. The soil is susceptible to clodding and puddling; it should not be cultivated when moisture conditions are unfavorable.

To maintain or increase yields this soil should be properly and adequately fertilized and cropped in a systematic rotation that includes legumes and grasses. Lime, phosphate, and probably potash will in-

crease crop yields appreciably. Nitrogen is also needed, but this element probably can be most economically supplied by including a legume in the rotation at frequent intervals. It is also important that the supply of organic matter be maintained or increased. A grass crop included in the rotation will aid in this respect. Green manuring and the application of barnyard manure will also increase the supply of organic matter.

Terraces and other mechanical means of runoff and erosion control should not be necessary if other good management practices are followed. Under good management average expectable yields are 40 bushels of corn, 400 pounds of cotton, 1.2 tons of lespedeza hay, and 1.1 tons of red clover hay an acre.

USE, MANAGEMENT, AND PRODUCTIVITY OF THE SOILS

This section consists of three major parts. The first explains how soils of the county are placed in five classes according to their relative suitabilities for agriculture, describes these classes, and tells which soils are in each class. The second part divides the soils of the county into groups needing about the same use and management, makes some suggestions concerning management practices for each group, and points out limitations that must be considered in applying these suggestions. The third part gives estimated average acre yields of principal crops to be expected on soils of the county under (1) management ordinarily practiced by most farmers in the area and (2) the best management farmers of the area feasibly could practice under present conditions.

USE SUITABILITY CLASSES

The physical suitability of a given soil for agricultural use depends on three factors—workability, conservability, and productivity. These factors are explained in the paragraphs following.

Workability, expressed in six descriptive terms, refers to ease of performing tillage and harvesting operations on a soil. Soils of *excellent* workability are generally light-textured to medium-textured, stone-free, and nearly level and therefore require minimum effort for tillage and harvesting. It is successively more difficult to perform normal farming operations on soils of *very good*, *good*, and *fair* workability, but they generally can be performed feasibly for crops requiring tillage, even on the soils of fair workability. Silty clay or clay soils, hilly soils, or soils that contain chert enough to interfere seriously with cultivation are classified as having *poor* workability. In this county soils with poor workability generally have slopes in excess of 25 percent or are so cherty or gravelly that tillage with ordinary implements is almost precluded. Soils with *very poor* workability are so steep, cherty, or both, that tillage generally must be done with hand implements.

Productivity, expressed in five descriptive terms, refers to the capacity of a soil to produce crops under prevailing farm practices. Soils of *very high* productivity have a good supply of available plant nutrients, moisture relations nearly ideal for crops, a reaction approaching neutral, and conditions favorable for good root develop-

ment. Soils defined as having *high, moderate, low, and very low* productivity are successively less favorable for plant growth.

Conservability, expressed in six descriptive terms, refers to the ease with which the content of available plant nutrients can be maintained at a high level, the ease of controlling runoff and consequent loss of soil material, and the ease of maintaining good tilth and good conditions for tillage. *Excellent* conservability means that productivity and workability can be maintained with minimum intensity of management. *Very good, good, and fair* conservability, respectively, represent soil conditions requiring successively more intensive management for conservation of productivity and workability. *Poor* conservability indicates that a soil is in such condition that productivity, workability, or both, can be conserved when it is used for crops requiring tillage, but that this can be done only under intensive management practices that are now not generally feasible on most farms. *Very poor* conservability represents the extreme in difficulty of conserving productivity, workability, or both.

The soils of this county were evaluated for agricultural suitability by considering the factors just discussed and were then placed in five use suitability classes—First-, Second-, Third-, Fourth-, and Fifth-class soils. Table 5 lists the soils in each of the five classes and gives the workability, productivity, and conservability of each soil.

TABLE 5.—*Soils of Decatur County, Tenn., arranged by use suitability classes and management groups, with ratings for workability, conservability, and general productivity of each soil*

[Soils in each management group arranged in approximate order of suitability for agriculture, the most suitable soil first]

FIRST-CLASS SOILS—GOOD TO EXCELLENT CROPLAND; GOOD TO EXCELLENT PASTURE LAND

Management group and soil	Workability ¹	Conservability ²	General productivity ³
GROUP 1:			
Huntington silt loam.....	Good.....	Excellent...	Very high.
Ennis silt loam.....	Very good.....	do.....	High.
Shannon silt loam.....	do.....	do.....	Do.
Shannon fine sandy loam.....	do.....	do.....	Do.
Bruno fine sandy loam ⁴	do.....	Very good...	Do.
GROUP 2:			
Emory silt loam.....	do.....	Excellent...	Very high.
Tigrett silt loam.....	Excellent.....	do.....	High.
Alva fine sandy loam.....	do.....	do.....	Do.
GROUP 3:			
Sequatchie fine sandy loam.....	do.....	Very good...	Do.
Humphreys silt loam.....	Very good.....	do.....	Do.
Pickwick silt loam, undulating phase.	do.....	do.....	Do.
Dexter silt loam, eroded undulating phase.	do.....	do.....	Do.
Pickwick silt loam, eroded undulating phase.	Good.....	Good.....	Do.

See footnotes at end of table.

TABLE 5.—*Soils of Decatur County, Tenn., arranged by use suitability classes and management groups, with ratings for workability, conservability, and general productivity of each soil—Continued*

FIRST-CLASS SOILS—GOOD TO EXCELLENT CROPLAND; GOOD TO EXCELLENT PASTURE LAND—Continued

Management group and soil	Workability ¹	Conservability ²	General productivity ³
GROUP 4:			
Dexter silt loam, rolling phase...	Very good...	Good.....	High.
Pickwick silt loam, rolling phase ⁴ ...	Good.....	do.....	Do.
Pickwick silt loam, eroded rolling phase. ⁴	do.....	Fair.....	Moderate.
Dexter silt loam, eroded rolling phase. ⁴	do.....	do.....	Do.
GROUP 5:			
Maury silty clay loam, eroded undulating phase.	do.....	Good.....	High.
Maury silt loam, rolling phase...	do.....	do.....	Very high.

SECOND-CLASS SOILS—FAIR TO GOOD CROPLAND; FAIR TO EXCELLENT PASTURE LAND

GROUP 5—Continued.			
Maury silty clay loam, eroded rolling phase.	Fair.....	Fair.....	High.
Maury silty clay loam, severely eroded rolling phase. ⁶	Poor.....	Poor.....	Moderate.
GROUP 6:			
Egam silty clay loam.....	Fair.....	Very good..	High.
GROUP 7:			
Briensburg silt loam.....	Very good..	do.....	Moderate.
Eupora fine sandy loam.....	do.....	do.....	Do.
GROUP 8:			
Lindside silt loam.....	Good.....	Excellent..	High.
Hymon silt loam.....	do.....	do.....	Moderate.
Hymon fine sandy loam.....	do.....	do.....	Do.
Lindside silty clay loam ⁶	Fair.....	do.....	Do.
GROUP 9:			
Humphreys cherty silt loam.....	do.....	Very good..	Do.
Greendale cherty silt loam, undulating phase.	do.....	do.....	Do.
Ennis cherty silt loam.....	do.....	do.....	Do.
Greendale cherty silt loam, rolling phase. ⁶	do.....	Good.....	Do.
GROUP 10:			
Freeland silt loam, undulating phase.	Very good..	do.....	Do.
Freeland silt loam, eroded undulating phase.	Good.....	do.....	Do.
Paden silt loam, undulating phase.	Very good..	do.....	Do.
Paden silt loam, eroded undulating phase.	Good.....	do.....	Do.
Dickson silt loam, undulating phase.	Very good..	do.....	Do.
Dickson silt loam, eroded undulating phase.	Good.....	do.....	Do.
Dulac silt loam, undulating phase.	Very good..	do.....	Do.

See footnotes at end of table.

TABLE 5.—Soils of Decatur County, Tenn., arranged by use suitability classes and management groups, with ratings for workability, conservability, and general productivity of each soil—Continued

SECOND-CLASS SOILS—FAIR TO GOOD CROPLAND; FAIR TO EXCELLENT PASTURE LAND—Continued

Management group and soil	Workability ¹	Conservability ²	General productivity ³
GROUP 10—Continued			
Dulac silt loam, slightly eroded undulating phase.	Very good..	Good.....	Moderate.
Dulac silt loam, eroded undulating phase.	Good.....	do.....	Do.
Savannah loam, undulating phase.	Very good..	do.....	Do.
Savannah loam, eroded undulating phase.	Good.....	do.....	Do.
Wolftever silt loam.....	Very good..	do.....	Do.
Wolftever silt loam, slightly eroded phase.	do.....	do.....	Do.
Wolftever silty clay loam, eroded phase.	Good.....	do.....	Do.
GROUP 11:			
Dulac silt loam, rolling phase.....	do.....	do.....	Do.
Dickson silt loam, rolling phase.....	do.....	do.....	Do.
Freeland silt loam, rolling phase.....	do.....	do.....	Do.
Paden silt loam, rolling phase.....	do.....	do.....	Do.
Savannah loam, rolling phase.....	do.....	do.....	Do.

THIRD-CLASS SOILS—POOR TO FAIR CROPLAND; FAIR TO VERY GOOD PASTURE LAND

GROUP 11—Continued:			
Dulac silt loam, eroded rolling phase.	Good.....	Fair.....	Low.
Dickson silt loam, eroded rolling phase.	do.....	do.....	Do.
Freeland silt loam, eroded rolling phase.	do.....	do.....	Do.
Paden silt loam, eroded rolling phase.	do.....	do.....	Do.
Savannah loam, eroded rolling phase.	do.....	do.....	Do.
Bodine silt loam, rolling phase.....	do.....	do.....	Do.
Bodine silt loam, eroded rolling phase.	do.....	do.....	Do.
Tippah silt loam, rolling phase.....	do.....	do.....	Do.
Tippah silt loam, eroded rolling phase. ⁶	do.....	Poor.....	Do.
GROUP 12:			
Dexter silty clay loam, severely eroded rolling phase.	Fair.....	do.....	Do.
Pickwick silty clay loam, severely eroded rolling phase.	do.....	Fair.....	Do.
GROUP 13:			
Bruno loamy fine sand.....	Good.....	Good.....	Moderate.
GROUP 14:			
Taft silt loam.....	do.....	do.....	Low.
Hatchie silt loam.....	do.....	do.....	Do.
Hatchie fine sandy loam.....	Very good..	do.....	Do.

See footnotes at end of table.

TABLE 5.—*Soils of Decatur County, Tenn., arranged by use suitability classes and management groups, with ratings for workability, conservability, and general productivity of each soil—Continued*

THIRD-CLASS SOILS—POOR TO FAIR CROPLAND; FAIR TO VERY GOOD PASTURE LAND—Continued

Management group and soil	Workability ¹	Conservability ²	General productivity ³
GROUP 15:			
Talbott silty clay loam, eroded undulating phase. ⁴	Fair.....	Good.....	Moderate.
Talbott silt loam, rolling phase ⁴ ..	Good.....	Fair.....	Do.
Talbott silty clay loam, eroded rolling phase.	Fair.....	do.....	Do.
Talbott stony silt loam, rolling phase.	Poor.....	do.....	Do.
GROUP 16:			
Bodine cherty-silt loam, rolling phase.	Fair.....	Good.....	Low.
Shubuta-Savannah fine sandy loams, rolling phases.	Good.....	Fair.....	Do.
Shubuta-Luverne fine sandy loams, rolling phases.	do.....	do.....	Do.

FOURTH-CLASS SOILS—POOR CROPLAND; POOR TO GOOD PASTURE LAND

GROUP 16—Continued:			
Shubuta-Savannah clay loams, eroded rolling phases.	Fair.....	Poor.....	Low.
Shubuta-Luverne clay loams, eroded rolling phases.	do.....	do.....	Do.
GROUP 17:			
Dexter silt loam, hilly phase ⁵	do.....	Fair.....	Moderate.
Pickwick silt loam, hilly phase ⁶ ..	do.....	do.....	Do.
Pickwick silt loam, eroded hilly phase.	do.....	Poor.....	Low.
Pickwick silty clay loam, severely eroded hilly phase.	Poor.....	do.....	Do.
Dexter silty clay loam, severely eroded hilly phase.	do.....	do.....	Do.
Waynesboro fine sandy loam.....	Fair.....	do.....	Moderate.
GROUP 18:			
Melvin silt loam.....	do.....	Excellent..	Do.
Beechy silt loam.....	do.....	do.....	Low.
Beechy fine sandy loam.....	do.....	do.....	Do.
Robertsville silt loam.....	do.....	Good.....	Do.
Almo silt loam.....	do.....	do.....	Do.
GROUP 19:			
Dulac silty clay loam, severely eroded rolling phase.	do.....	Poor.....	Very low.
Dickson silty clay loam, severely eroded rolling phase.	do.....	do.....	Do.
Freeland silty clay loam, severely eroded rolling phase.	do.....	do.....	Do.
Paden silty clay loam, severely eroded rolling phase.	do.....	do.....	Do.
Savannah clay loam, severely eroded rolling phase.	do.....	do.....	Do.
Bodine silty clay loam, severely eroded rolling phase.	do.....	do.....	Do.

See footnotes at end of table.

TABLE 5.—Soils of Decatur County, Tenn., arranged by use suitability classes and management groups, with ratings for workability, conservability, and general productivity of each soil—Continued

FOURTH-CLASS SOILS—POOR CROPLAND; POOR TO GOOD PASTURE LAND—Con.

Management group and soil	Workability ¹	Conservability ²	General productivity ³
GROUP 20:			
Talbott stony silty clay loam, eroded rolling phase.	Poor.....	Poor.....	Moderate.
Talbott stony silty clay loam, severely eroded rolling phase.	do.....	Very poor..	Low.
Talbott silty clay loam, severely eroded rolling phase.	Fair.....	Poor.....	Do.
Talbott silt loam, hilly phase.....	do.....	do.....	Do.
Talbott silty clay loam, eroded hilly phase.	Poor.....	do.....	Do.
Talbott stony silt loam, hilly phase.	do.....	Very poor..	Moderate.
Talbott stony silty clay loam, eroded hilly phase.	Very poor..	do.....	Poor.
Safford very fine sandy loam, hilly phase.	Fair.....	Poor.....	Moderate.
Inman silt loam, hilly phase.....	do.....	do.....	Do.
Inman silty clay loam, eroded hilly phase.	Poor.....	do.....	Do.
GROUP 21:			
Bodine silt loam, hilly phase.....	Fair.....	Fair.....	Low.
Bodine silt loam, eroded hilly phase.	do.....	Poor.....	Do.
Bodine cherty silt loam, hilly phase.	Poor.....	Fair.....	Do.
Bodine cherty silt loam, eroded hilly phase.	do.....	do.....	Do.
Etowah gravelly silt loam, hilly phase.	do.....	do.....	Do.
Etowah gravelly silt loam, eroded hilly phase.	do.....	Poor.....	Do.

FIFTH-CLASS SOILS—VERY POOR CROPLAND; POOR TO VERY POOR PASTURE LAND; PROBABLY BEST SUITED TO FOREST UNDER PRESENT CONDITIONS

GROUP 22:			
Bodine cherty silt loam, severely eroded hilly phase.	Poor.....	Poor.....	Very low.
Talbott stony silty clay loam, severely eroded hilly phase.	Very poor..	Very poor..	Low.
Talbott silty clay loam, severely eroded hilly phase.	Poor.....	do.....	Do.
Shubuta-Savannah clay loams, severely eroded rolling phases.	Fair.....	do.....	Very low.
Cuthbert-Savannah clay loams, severely eroded hilly phases.	Very poor..	do.....	Do.
Cuthbert-Savannah clay loams, eroded hilly phases.	Poor.....	do.....	Do.
Cuthbert-Luverne clay loams, eroded hilly phases.	do.....	do.....	Do.
Cuthbert-Luverne clay loams, severely eroded hilly phases.	Very poor..	do.....	Do.
Safford clay loam, severely eroded hilly phase.	Poor.....	do.....	Low.

See footnotes at end of table.

TABLE 5.—*Soils of Decatur County, Tenn., arranged by use suitability classes and management groups, with ratings for workability, conservability, and general productivity of each soil—Continued*

FIFTH-CLASS SOILS—VERY POOR CROPLAND; POOR TO VERY POOR PASTURE LAND; PROBABLY BEST SUITED TO FOREST UNDER PRESENT CONDITIONS—COR.

Management group and soil	Workability ¹	Conservability ²	General productivity ³
GROUP 22—Continued			
Ruston fine sandy loam, eroded hilly phase.	Poor.....	Poor.....	Low.
Ruston sandy clay loam, severely eroded hilly phase.	..do.....	Very poor..	Very low.
Tippah silty clay loam, severely eroded rolling phase.	Fair.....	..do.....	Do.
Etowah gravelly silt loam, severely eroded hilly phase.	Poor.....	..do.....	Do.
Rough gullied land (Cuthbert and Luverne soil materials).	Very poor..	..do.....	Do.
Rough gullied land (Savannah and Ruston soil materials).	..do.....	..do.....	Do.
Rough gullied land (Tippah and Dulac soil materials).	..do.....	..do.....	Do.
Rough gullied land (Freeland and Paden soil materials).	..do.....	..do.....	Do.
Rough gullied land (Etowah and Dexter soil materials).	..do.....	..do.....	Do.
Rough gullied land (Talbot soil material).	..do.....	..do.....	Do.
Bodine cherty silt loam, steep phase.	..do.....	Poor.....	Low.
Susquehanna very fine sandy loam.	..do.....	Very poor..	Very low.
Cuthbert-Savannah fine sandy loams, hilly phases.	Fair.....	..do.....	Do.
Cuthbert-Luverne fine sandy loams, hilly phases.	..do.....	..do.....	Do.
Ruston fine sandy loam, hilly phase.	..do.....	Poor.....	Low.
Ruston fine sandy loam, steep phase.	Very poor..	Very poor..	Do.
Etowah gravelly silt loam, steep phase.	..do.....	Poor.....	Do.
Talbot stony silt loam, steep phase.	..do.....	Very poor..	Do.
Rolling stony land (Talbot and Colbert soil materials).	..do.....	Poor.....	Very low.
Hilly stony land (Talbot and Colbert soil materials).	..do.....	Very poor..	Do.

¹ Workability refers to ease of tillage, harvesting, and other field operations. Texture, structure, consistence, stoniness, and degree of slope are important among the properties that affect workability.

² Conservability refers to the ease with which the productivity and workability of the soil can be maintained. The degree to which the soil responds to good management practices is also reflected in the conservability of the soil.

³ Productivity refers to the capacity of the soils to produce crops. The soil may be productive of a crop but not well suited to it because of poor workability, poor conservability, or both.

⁴ Second-class soils.

⁵ Third-class soils.

⁶ Fourth-class soils.

Information from farmers, soil surveyors, extension workers, experiment station personnel, and others who work with the soil was obtained and used in classifying the soils. A farmer, for example, knows that some soils on his farm are better suited to agriculture than others and will volunteer his information. After gathering such information and comparing soils on farms and among farms, the soils of the county were placed in approximately their order of suitability for agriculture. In some instances experience was lacking. When this occurred, the soils were ranked by comparing them with similar soils for which information was available.

The five use suitability groupings express judgment as to the relative suitability of the various soils for the present agriculture of the area, but they should not be taken as a recommendation for use. Other circumstances must be taken into account in determining what is the best use on a particular farm.

FIRST-CLASS SOILS

First-class soils are productive, easy to work, and easy to conserve; consequently, they are physically well suited to common crops of the area. They are good to excellent both for crops requiring tillage and for permanent pasture. They are relatively well supplied with organic matter and plant nutrients in comparison with other soils in the county, but some crops grown on them respond to fertilization. They contain more lime than most other soils of the county but are nevertheless usually slightly deficient in it. They are well drained but their physical properties are such that they retain moisture well and provide an adequate and even supply for plant growth. Good tilth is easily obtained and maintained. The range of moisture conditions suitable for tillage is comparatively wide. Air, moisture, and roots penetrate all parts of the subsoils freely.

None of these soils has any prominent adverse soil conditions. They are almost free of stone, have relief favorable to soil conservation and tillage, and are not severely eroded or highly susceptible to erosion. They are relatively high in natural fertility and easily tilled; they do not present any serious problem in conserving soil fertility or soil material.

SECOND-CLASS SOILS

Second-class soils are good for agriculture. They are fair to good for crops requiring tillage and fair to excellent for permanent pasture.

Second-class soils are at least moderately productive of most of the crops commonly grown in the area. Their physical properties are at least moderately favorable for tillage, maintenance of good tilth, and normal circulation and retention of moisture. None occupies slopes greater than 12 to 15 percent, is sufficiently cherty to interfere seriously with tillage, or is severely eroded. Each is moderately deficient in one or more properties that contribute to productivity, workability, or conservability, but not so deficient as to be poorly suited to crops requiring tillage.

The soils of the class vary widely in deficiencies. Some are fertile but sloping and moderately eroded; others are almost level and uneroded but relatively low in plant nutrients or restricted in drainage. In consequence, management requirements vary greatly. The soils

are relatively similar in suitabilities for agriculture, but the management practices needed to obtain the benefits of their suitabilities are greatly different.

THIRD-CLASS SOILS

Third-class soils are fair for agriculture. They are poor to fair for crops requiring tillage and fair to very good for permanent pasture.

Each soil is so deficient in workability, conservability, or productivity, or in some combination of the three, that its suitability for crops requiring tillage is definitely limited. These soils are better suited to crops requiring tillage than Fourth-class soils but are less well suited than Second-class soils. They are limited for tilled crops because of one or more of the following: Low content of plant nutrients and organic matter, low water-holding capacity, undesirable texture, structure, or consistence, strong slope, chertiness, or inadequate natural drainage. Because of their diverse characteristics, soils of this group range widely in management requirements.

FOURTH-CLASS SOILS

Fourth-class soils are poorly suited to crops that require tillage, and poor to very good for permanent pasture. They are poor agricultural soils mainly because they are suited to a limited number of uses. Nevertheless, if other soils suited to permanent pasture are in great demand, some of these may be the most important soils on certain farms.

Each soil of this group is so difficult to work or conserve, or both, that management practices necessary for successful growing of crops that require tillage are not feasible under present conditions. On some farms, however, soils well suited to crops requiring tillage may be so limited that the farmer has to manage his Fourth-class soils intensively so he can use them for tilled crops. The intensity of management given areas of Fourth-class soils used for crops, however, is generally inadequate for good soil conservation. On farms where the acreage of soils well suited to crops is adequate, Fourth-class soils are generally used for pasture. As for soils of the Third class, management requirements, both for crops requiring tillage and for pasture, vary widely among Fourth-class soils.

FIFTH-CLASS SOILS

Fifth-class soils are very poorly suited to agriculture. They are very poor for crops requiring tillage and poor to very poor for permanent pasture. Each soil of this group is so difficult to work, so difficult to conserve, so low in productivity, or has such combinations of these unfavorable properties that it is generally not feasible to apply the management necessary to grow crops requiring tillage. Each is so low in content of plant nutrients or so poor in moisture relationships, or both, that common pasture plants produce little feed.

These soils are apparently best suited to forest under present conditions, even though they are likely less productive of forest than soils of any of the preceding groups. Existing conditions in the locality or on the farm may require the use of some Fifth-class soils for pasture or crops, even though they are now poorly suited to that use.

SOIL USE AND MANAGEMENT*

All soils in one use suitability class have a similar degree of suitability for agriculture, but it does not follow that all soils in that class will respond to the same use and management practices. Soils in one class differ in workability, conservability, and productivity and therefore differ considerably in the use and management they require. One soil may require special practices to improve workability, and another special practices to improve conservability, yet both may be in the same use suitability class. Because this is so, it is necessary to break the use suitability classes down into groups of soils similar in use and management requirements and then suggest suitable use and management for each group.

Suggesting management practices is difficult, however, for management requirements differ according to soil use. Management of soils used for tilled crops differs from management of the same soils used for pasture. In fact, if the rotation is different, management is not identical even when a soil is used for the same crop. The management of one crop in a rotation generally affects the production of the other crops. The management of a given soil on one farm, furthermore, may not be entirely like that necessary for the same kind of soil on another farm. This is so because management of a given soil is affected by the kinds of soil with which it is associated, the type of agriculture carried on, and other conditions peculiar to the particular farm. Even general recommendations must often be modified when put into practice. This must be considered in reading in the section on Management Groups.

MANAGEMENT GROUPS

Soils of this county requiring about the same use and management are placed in 22 groups. As can be noted in table 5, the soils in one management group usually belong to the same use suitability class. In some instances, however, soils of different classes, as for example, First- and Second-class soils, are placed in one management group because they apparently need the same management.

The various management groups are separately discussed and some suggestions concerning management are made. The discussions are confined chiefly to pointing out the principal deficiencies of the soils so the reader may gain a general idea of what needs to be done to use his soils productively. The management practices suggested are those thought good under conditions existing on many farms in the area and can be used as a guide in determining what practices are generally suitable. The management practices suggested are those used to define the level of management necessary to obtain crop yields listed in columns B of table 6. It is recognized that certain of the suggested practices may not be feasible for many farmers in the area under present conditions. Also, combinations of practices other than those suggested may be used to achieve the same result. For example,

* Soil use refers to broad classes of use into which soils can be placed; that is, for crops requiring tillage, for permanent pasture, or for forest. Soil management refers to such practices as choice and rotation of crops, application of lime, commercial fertilizer, manure, and crop residues; tillage practices; and engineering measures for controlling water on the land.

nitrogen is necessary to maintain yields of many crops, but the essential nitrogen can be supplied by using legumes, manure, commercial fertilizer, or a combination of the three. The best method of supplying nitrogen will depend on conditions on the particular farm. A soil test is a helpful guide to fertilization. See your county agent about getting your soil tested.

The management groupings are based on similarities in the management requirements that should be met for crops requiring tillage, but management requirements for permanent pasture are also discussed. Generally, requirements for permanent pasture are about the same for all soils in one management group, but requirements for tilled crops may be very different among the soils in one group, chiefly because tillage itself brings more exacting management requirements for most soils of the area.

MANAGEMENT GROUP 1—WELL-DRAINED NONCHERTY BROWN SOILS OF THE BOTTOM LANDS

Bruno fine sandy loam.
Ennis silt loam.
Huntington silt loam.

Shannon fine sandy loam.
Shannon silt loam.

Management group 1 is made up of good to excellent crop and pasture soils. All of them are high to very high in productivity and easily to very easily worked and conserved. They are nearly level and not subject to erosion. All are relatively high in lime, organic matter, and plant nutrients and are replenished periodically by additions of fresh sediment. Moisture conditions are favorable for plant growth. The soils are well drained but are subject to flooding, chiefly during winter and spring. Susceptibility to floods limits their use suitability.

Management requirements.—Soils of this group are physically suited to intensive use, but danger of flooding limits their use largely to summer annual crops. They are well suited to corn and many forage crops and very well suited to summer annual hay crops such as lespedeza and soybeans. Fertilization or liming is not needed for continued high yields of crops for which the soils are suited and used, but a good response is obtained from fertilizer and lime in many places. Yields of corn are increased in some areas by using a short rotation that includes a legume crop to be turned under. Management of these soils is concerned chiefly with improving tillage practices and more timely seeding of higher yielding varieties.

These soils are particularly well suited to pasture, chiefly because they have very favorable moisture relations and relatively high fertility. They are subject to flooding, however, which may damage the pasture by depositing mud. Weeds grow vigorously and are a definite detriment to pastures. The generally smooth surface of the soils greatly facilitates eradication of weeds by mowing. The pastures may respond to treatment with lime and fertilizer, but their requirement for such treatment is not exacting.

MANAGEMENT GROUP 2—WELL-DRAINED BROWN SOILS OF THE COLLUVIAL LANDS

Alva fine sandy loam.
Emory silt loam.

Tigrett silt loam.

The soils of management group 2—well-drained brown soils of colluvial lands—are good to excellent for crops and pasture. They

have high to very high productivity and are easily to very easily worked and conserved. They are gently sloping. Surface drainage is good, but they are not subject to erosion in many places. They are well drained and differ from soils of group 1 in being subject to floods only for very short periods. All are relatively high in lime, organic matter, and plant nutrients. Moisture conditions are favorable for plant growth. Crops can withstand both droughts and extended wet periods. The soils are well suited to a wide variety of crops, including corn, cotton, and lespedeza. They are also well suited to clover, alfalfa, and other crops not commonly grown in the county. The soils occur in small areas but are very important to the farm on which they occur.

Management requirements.—The soils of this group are suited to intensive use, and comparatively good yields can be obtained without fertilization. They respond very well to good management, however, and will produce greatly increased yields if fertilization and crop rotation are practiced. The rotation presumably can be short but it should include a legume crop. A rotation of wheat, red clover, corn, and soybeans appears to be suitable. In this rotation other small grains can be substituted for wheat, and cotton, sorghum, or vegetables may be used instead of corn or soybeans.

Most of the fertilizing elements are needed to increase crop yields and maintain them at a high level. Lime, phosphate, and possibly potash are needed for the legume crops, especially the deep-rooted ones. The legume crop, especially if turned under, should supply adequate nitrogen for most other crops in the rotation. Phosphorus should bring a good response from all crops. Potash may be needed. The need for potash will depend largely on the crop to be grown or the amounts previously applied.

All of these soils are easily maintained in good tilth. They can be cultivated over a fairly wide range in moisture conditions without damage. They are not generally susceptible to erosion, but in some places terraces or diversion ditches may be advisable to divert runoff from upland slopes from these soils.

These soils are well suited to pasture, chiefly because they have favorable moisture conditions and relatively high fertility. Nevertheless, lime and phosphorus are required in most places if highly productive pastures are to be established and maintained. Some mixture of orchard grass, redtop, bluegrass, white clover, red clover, and Ladino clover is well suited. Weeds grow vigorously and are detrimental to the pasture because they compete for moisture and crowd out desirable pasture plants. Periodic mowing will aid in controlling weeds.

MANAGEMENT GROUP 3—UNDULATING WELL-DRAINED NONCHERTY FRIABLE RED AND BROWN SOILS OF THE TERRACE LANDS

Dexter silt loam, eroded undulating phase.	Pickwick silt loam, eroded undulating phase.
Humphreys silt loam.	Pickwick silt loam, undulating phase. Sequatchie fine sandy loam.

The soils of management group 3 are gently sloping and good to excellent for both crops and pasture. All are highly productive and easily to very easily worked and conserved. They have mild slopes, are not seriously eroded, and are not especially susceptible to erosion.

All are relatively high in organic matter and plant nutrients, compared to the soils of the uplands, and all have moisture conditions favorable for plant growth.

Management requirements.—The soils of this group are suited to intensive use for a wide variety of crops, including corn, cotton, small grains, alfalfa, red clover, crimson clover, sweetclover, and various vegetable crops. Provided legumes are included and other management requirements are met, the soils can be conserved and their productivity maintained or increased under a rotation that includes a row crop every third year. Winter cover crops and green manure crops are useful means of conserving soil moisture, improving tilth, and supplying nitrogen and humus.

The soils of this group are generally deficient in lime, phosphorus, and nitrogen. Properly conserved manure is an excellent source of both nitrogen and potash, but it should be supplemented with a phosphate fertilizer to obtain a balance of plant nutrients. Corn, cotton, and small grains respond well to a complete fertilizer. The legumes, especially deep-rooted ones, require lime and phosphorus, but if inoculated, need no nitrogen. An inoculated legume crop, especially if it is turned under, will generally supply the needed nitrogen for other crops in a short rotation.

Good tilth is easily maintained, and tillage can be carried on over a fairly wide range of moisture conditions without seriously impairing the physical properties of the soils. Controlling erosion and conserving soil moisture are not serious problems when crops are properly chosen and adequately fertilized and limed. Mechanical devices for controlling erosion are not generally needed, but contour tillage is a good practice wherever feasible.

Though soils of this group are physically very well suited to pasture, they are seldom used for that purpose because they are so well suited to more intensive use. When they are used for pasture, management is concerned principally with supplying amendments, chiefly lime and phosphorus, to suitable pasture plants. Other requirements include proper control of grazing and scattering of droppings. On pastures that receive adequate amendments and are properly grazed, the problem of weed control is not serious, but mowing is necessary to remove excess herbage and undesirable plants.

MANAGEMENT GROUP 4—ROLLING WELL-DRAINED FRIABLE RED SOILS OF THE TERRACE LANDS (NOT SEVERELY ERODED)

Dexter silt loam, eroded rolling phase. Pickwick silt loam, eroded rolling phase.
Dexter silt loam, rolling phase. Pickwick silt loam, rolling phase.

Management group 4 is composed of good crop and good to excellent pasture soils, all moderate to high in productivity, easy to work, and fairly easy to conserve. They are on 5- to 12-percent slopes and are moderately susceptible to erosion, but none is now seriously eroded. They are moderately high in organic matter and plant nutrients and have moisture conditions favorable for plant growth.

These soils have a wide range in use suitability. They are suited to a wide variety of crops, including corn, cotton, small grains, soybeans, peanuts, and many vegetable crops. Properly limed and fertilized, they are well suited to alfalfa, red clover, and similar crops.

Management requirements.—To increase and maintain crop yields

at a higher level, systematic crop rotation and fertilization are required. When other management requirements are met, these soils can be conserved under a 4- to 6-year rotation. A suitable rotation is wheat, red clover and grass for 3 years, corn followed by a cover crop, and cotton. Barley, rye, or oats can be substituted for wheat, and soybeans, sweetpotatoes, or a vegetable crop may replace the corn or cotton. Vetch or crimson clover can be used for the cover crop.

These soils are generally deficient in lime, phosphorus, and nitrogen. The legumes, especially the deep-rooted ones, require lime and phosphorus but, if inoculated, do not need nitrogen. An inoculated legume, especially if it is turned under, will generally supply the nitrogen other crops in a rotation need. All crops respond to phosphorus, and a good response is expected from a complete fertilizer applied to corn, cotton, and small grains. Properly conserved manure is a good source of nitrogen and potash, but it should be supplemented with a phosphate fertilizer to obtain a balance of plant nutrients.

Good tillth is easily maintained, and tillage can be carried on over a fairly wide range of moisture conditions without impairing the physical properties of the soils. The soils are moderately susceptible to erosion, but runoff and erosion control should not be serious problems if other management practices are good. Contour tillage should be practiced wherever feasible, however, and contour strip cropping may be advisable on the long slopes. If these soils are to be used for cultivated crops, terraces may be necessary in some places. Terraces should be effective because the soils are permeable and have regular slopes.

These soils are physically well suited to pasture. Pasture management will be concerned chiefly with supplying amendments, chiefly lime and phosphorus, to suitable pasture plants. Other requirements are proper control of grazing and scattering of droppings. Weed control is not a serious problem on pastures adequately fertilized and limed and properly grazed, but mowing is necessary.

MANAGEMENT GROUP 5—UNDULATING AND ROLLING WELL-DRAINED BROWN PHOSPHATIC SOILS OF THE UPLANDS

Maury silt loam, rolling phase.	Maury silty clay loam, eroded undulating phase.
Maury silty clay loam, eroded rolling phase.	Maury silty clay loam, severely eroded rolling phase.

Soils of management group 5 are good for crops and good to excellent for pasture. They are undulating to rolling, with slopes of 2 to 12 percent. They vary considerably in susceptibility to erosion, but most of them are moderately susceptible. The group includes soils varying from uneroded to severely eroded. Compared to other upland soils, these soils are high in plant nutrients, especially phosphorus. Their content of phosphorus is high, but the content of other elements, especially nitrogen, varies greatly depending on the degree of erosion and the cropping system that has been followed. The soils are suited to all the common crops of the county.

Management requirements.—The management practices should be concerned with maintenance or increase of nitrogen, potash, and organic matter. Practices to control runoff and erosion and to increase the water available for growing plants should be followed.

It is desirable to keep the soils in a rotation that includes close-growing crops, preferably deep-rooted legumes, most of the time. Suitable is a rotation of cotton or corn, small grain, and red clover and grass for 3 years for hay or pasture. The inclusion of as many pasture crops as feasible is considered a good practice, for bluegrass and clovers do better on these soils than on most others in the county.

The factor most generally limiting crop production is need of nitrogen, but some potassium is also needed in places. The available supply of phosphorus is apparently adequate for all crops. Lime is necessary for best results with the legumes, especially those that are deep-rooted. In the rotation suggested the leguminous crops may be depended upon to maintain the needed supply of nitrogen, especially after the nitrogen content of the soils has been built up to a fairly high level. A few leguminous crops turned under would aid in building the content of both nitrogen and organic-matter to a relatively high level. The quantity of each fertilizer to apply naturally will vary with past management of the soil. In some areas it may not be necessary to apply potash, and where manure is used liberally, potash may be left out of the fertilizer mixture entirely. Manure, either in the form of manure crops or barnyard litter, is very beneficial to most crops. It is especially helpful in establishing a stand on severely eroded spots.

High susceptibility to erosion makes contour tillage and a vegetative cover very important on these soils. A cover crop, preferably of legumes, following the intertilled crops not only aids in controlling erosion but also adds needed nitrogen and organic matter to the soil. Terracing should be considered for the longer slopes if intertilled crops must be grown. Terracing usually will not be necessary for controlling runoff on short slopes if the rotation consists chiefly of close-growing crops. Strip cropping may be practicable and desirable in many places on long and relatively uniform slopes.

These soils can be made to produce excellent pastures, provided they receive lime and potash. After a good sod is established, additional potash may not be necessary. Liming and fertilization are intended to aid the growth of legumes, which will in turn fix nitrogen for the other plants in the pasture mixture. Moderate grazing and clipping of ungrazed spots will also aid in promoting the growth of legumes. The scattering of droppings likewise aids in the even distribution of potash and nitrogen and insures uniform grazing. Clipping of weeds will aid in keeping a stand of more desirable pasture crops. With proper liming and fertilization, some mixture of orchard grass, white clover, Ladino clover, and red clover is suitable. On the severely eroded areas, an application of barnyard manure will aid in establishing the stand.

MANAGEMENT GROUP 6—MODERATELY WELL DRAINED HEAVY SOILS
OF THE BOTTOM LANDS

Egam silty clay loam, the only soil of management group 6, is a first-bottom soil subject to periodic overflow. Compared to other soils of the county, it has a high content of lime, organic matter, and plant nutrients. The supply of moisture for growing plants is low, however, and crops are very susceptible to injury from droughts. Susceptibility to overflow and to droughts makes the use suitability

very limited. The soil is well suited to soybeans, lespedeza, sorgo, and spring oats but poorly suited to corn. It is unsuited to cotton, small grains, or crops such as crimson clover, alfalfa, or red clover.

Management requirements.—This soil can be intensively used for the crops to which it is suited. Crop yields apparently can be maintained under continuous cropping without fertilization. The management will be concerned chiefly with selection of drought-resistant varieties and improved seedbed preparation and tillage practices. The tilth is poor. The soil can be cultivated over only a very narrow range of moisture conditions. The seedbed, consequently, is often insufficiently prepared, and tillage practices are frequently poorly timed and inadequate. A well-prepared seedbed will promote better germination of seed and better early growth of crops. The use of a rotation that includes a legume and the plowing under of green-manure crops should improve the tilth as well as the productivity of the soil.

The soil is fairly well suited to pasture, but its associations are such that it is rarely so used. Fair pastures can be obtained just by preparing the seedbed and seeding.

MANAGEMENT GROUP 7—IMPERFECTLY DRAINED SOILS OF THE COLLUVIAL LANDS

Briensburg silt loam.

Eupora fine sandy loam.

The soils of management group 7 are good for crops and good to excellent for pasture. They are not generally subject to overflow, but they receive additional sediments from adjacent upland slopes. They are strongly to very strongly acid, medium in organic matter, moderately low in most plant nutrients. They have friable permeable profiles and moisture relations satisfactory for plant growth except in wet seasons. The soils are in small individual areas but are very important to the farms where they occur, chiefly because they are associated with much less productive upland soils. They are somewhat limited in use suitability by imperfect drainage but are suited to corn, cotton, lespedeza, sweetclover, sorghum, and most other common crops of the county. They are less well suited to red clover or crimson clover and are very poorly suited to alfalfa.

Management requirements.—Although these soils are suited to intensive use, a short rotation that includes a legume and fertilization are generally necessary to maintain or increase crop yields. A 4-year rotation consisting of wheat, legumes and grass, corn, and soybeans appears suitable. Another suitable rotation consists of wheat, sweetclover, and corn. In this last rotation other small grains can be substituted for wheat, and sorghum, cotton, or vegetables for the corn. Longer rotations suitable for use include 2 to 4 years of grasses and legumes mixed and 1 or 2 years of a cultivated crop. Some mixture of white clover, lespedeza, alsike clover, tall fescue, and orchard grass, or a mixture of only some of these, can be grown for hay or pasture.

Fair crop yields are obtained without fertilization, but to increase yields and maintain them at a high level most of the common elements are needed. Lime, phosphate, and possibly potash are needed for the legume crops, particularly those that are deep-rooted. The legume crop, especially if turned under, should supply an adequate quantity of nitrogen for most of the other crops in the rotation. Barnyard manure, if available in sufficient quantities, is an excellent source of

nitrogen, potash, and organic matter. Phosphorus is probably needed by all crops. Cotton, usually the cash crop, responds well to a complete fertilizer. In most areas potash greatly aids in controlling rust on cotton.

Both of these soils are easily maintained in good tilth, although tillage may be delayed in spring because of unfavorable moisture conditions caused by imperfect drainage. The use suitability and general productivity can be improved by artificial drainage, but the advisability of drainage will depend on many factors other than the response of the soils. Imperfect drainage is in most places caused by seepage from adjacent upland slopes, and intercepting tile drains or open ditches should improve it.

These soils are well suited to pasture, chiefly because of their very favorable moisture relations. Pastures, however, can be greatly improved by proper fertilization and seeding. Lime and phosphorus are required if very good pastures are to be established and maintained. With proper fertilization, a mixture of tall fescue or orchard grass, white clover, alsike clover, and lespedeza is well suited. Weeds are common on these soils. They compete for moisture and crowd out desirable pasture plants. Periodic mowing will aid in keeping down weeds.

MANAGEMENT GROUP 8—IMPERFECTLY DRAINED SOILS OF THE BOTTOM LANDS

Hymon fine sandy loam.

Lindside silt loam.

Hymon silt loam.

Lindside silty clay loam.

Management group 8 is composed of soils good for crops and good to excellent for pasture. As a group they are moderately productive, easily worked, and very easily conserved. All are imperfectly drained soils of first bottoms subject to overflow. They vary in content of lime, organic matter, and plant nutrients but are all better supplied with these than the soils of the uplands with which they are associated. Fresh sediment deposited by floodwaters aids in maintaining the supply of plant nutrients and organic matter.

Imperfect drainage and susceptibility to flooding limit the crops that can be grown. Many feed and forage crops such as corn, soybeans, alsike clover, redtop, and white clover are expected to do well. The soils are poorly suited to alfalfa, red clover, small grains, and cotton. Adequate supplies of moisture are generally available for plant growth, and crops are not injured by drought so often as on the adjacent uplands.

Management requirements.—Favorable workability and conservability make these soils suitable for intensive use. Row crops can be grown every year or in alternate years, but a legume green-manure crop is needed in many places to maintain the supply of organic matter and nitrogen. Where practical, a short rotation of corn and hay crops is desirable.

Even though these soils receive annual increments of soil material, they are generally deficient in lime, phosphorus, potash, and nitrogen. All crops except legumes need complete fertilizers. Legumes need phosphorus and potash but no nitrogen. Lime is necessary in many places to obtain satisfactory stands of legumes, and it increases the yield and improves the quality of the succeeding crops.

All of these soils except Lindside silty clay loam are easily maintained in good tilth, but tillage may be delayed early in spring and during rainy seasons because of unfavorable moisture conditions caused by imperfect drainage. These soils are not ordinarily susceptible to erosion, but they may be scoured unless stream banks are built up in some places. The use suitability and general productivity of these soils can be improved by artificial drainage, but the advisability of drainage and the kind of drain to use on any particular area will depend upon many factors, including cost, feasibility of drainage from an engineering standpoint, and kinds and areas of other soils on the farm.

The soils of this group are well suited to pasture. Fairly good pastures can be obtained by preparing the seedbed and seeding. The use of lime and phosphorus, however, will improve the quality and increase pasture yields. Some mixture of tall fescue or orchard grass, white clover, alsike clover, and lespedeza is suited to these soils. Control of grazing is important during wet seasons. Otherwise trampling injures the pasture sod and the physical properties of the soils. Mowing to eradicate weeds and remove excess herbage is necessary on pastures.

MANAGEMENT GROUP 9—WELL-DRAINED CHERTY SOILS OF THE COLLUVIAL, TERRACE, AND BOTTOM LANDS

Ennis cherty silt loam.

Greendale cherty silt loam, rolling phase.

Greendale cherty silt loam, undulating phase.

Humphreys cherty silt loam.

Management group 9 is made up of alluvial and colluvial soils characterized by much chert on the surface and throughout the profile. The Ennis soils are subject to flooding for very short periods at frequent intervals. The Humphreys soils are flooded at infrequent intervals, but the Greendale soils are not commonly flooded by any stream. The soils are medium to very strongly acid and moderate in content of organic matter and plant nutrients. The internal drainage of all these soils is rapid, and the water-holding capacity is low. The soils are fairly well suited to most of the common crops of the county, but their suitability is limited somewhat by chertiness and droughtiness. They are apparently very well suited to early vegetable crops, small grains, crimson clover, and vetch. They are not so well suited to crops that mature late in summer or in fall.

Management requirements.—These soils are suited to relatively intensive use, but crop rotation and fertilization will probably be required to maintain or increase yields. The rotation presumably can be short, but it should include a legume. A rotation consisting of wheat or other small grains, clover and red clover, and corn appears suitable. Peanuts or other row crops may be substituted for the corn, and sweetclover, alfalfa, or lespedeza may be used instead of red clover.

These soils are younger and less leached than the associated upland soils but are generally moderately deficient in phosphorus, nitrogen, and probably potash. All crops will respond to phosphorus. Corn, small grains, and grasses will respond to nitrogen, and possibly to potash. Legumes and legume-grass mixtures that have been properly inoculated need no nitrogen, but they require phosphorus and potash.

Barnyard manure is an excellent source of nitrogen, potash, and organic matter for all crops. These soils are generally acid and in most places lime is needed to maintain good stands of deep-rooted legumes.

These soils are not susceptible to erosion in many places. Tillage, however, should be on the contour on the more sloping areas. The high chert content materially interferes with tillage. In some places it may be practical to remove the larger surface chert fragments and thus improve workability.

The soils of this group are fair to good for pasture. A large acreage is used for pasture, chiefly because it is near barnyards. Pastures are very good early in the season but are generally poor late in summer and in fall. Some mixture of orchard grass, white clover, and red clover is well suited. Pasture management is concerned chiefly with supplying lime, phosphorus, and potassium to properly selected pasture mixtures, properly controlling grazing, scattering of droppings, and mowing to remove excess herbage and eradicate weeds.

MANAGEMENT GROUP 10—UNDULATING MODERATELY WELL DRAINED BROWNISH-YELLOW FRIABLE SILTPAN SOILS OF THE TERRACE AND UPLANDS

Dickson silt loam, eroded undulating phase.	Paden silt loam, eroded undulating phase.
Dickson silt loam, undulating phase.	Paden silt loam, undulating phase.
Dulac silt loam, eroded undulating phase.	Savannah loam, eroded undulating phase.
Dulac silt loam, slightly eroded undulating phase.	Savannah loam, undulating phase.
Dulac silt loam, undulating phase.	Wolftever silt loam.
Freeland silt loam, eroded undulating phase.	Wolftever silt loam, slightly eroded phase.
Freeland silt loam, undulating phase.	Wolftever silty clay loam, eroded phase.

The soils of management group 10 are more exacting in management requirements than those of groups previously discussed, especially in regard to fertilization and choice and rotation of crops. They are physically suitable for crops but naturally low in fertility. Their good tilth, gentle slopes, and freedom from gravel or stone make them easy to work. Nevertheless, they are low in organic matter and plant nutrients and strongly to very strongly acid. All have siltpans that interfere with water movement and restrict root penetration. Chiefly because of low fertility and low water-holding capacity, these soils are low in productivity and somewhat limited in use suitability. Deep-rooted crops such as alfalfa do not succeed so well as on soils penetrable to greater depth. These soils, however, are fairly well suited to cotton, corn, lespedeza, cowpeas, redtop, sweet-potatoes, and most crops commonly grown in the county. Fertilizer and lime are required to establish alfalfa, sweetclover, and red clover.

Management requirements.—Soils of group 10 are suited to moderately intensive use. If other management requirements are met they probably can be conserved under rotations that include a row crop once in 3 to 5 years. It is important that crops and the rotations be chosen in accordance with soil capabilities. These soils are relatively low in organic matter and nitrogen, so a legume crop should be in the rotation to help make up for these deficiencies. Keeping a crop on the land as much of the time as possible will help prevent leaching of nitrogen and other soluble plant nutrients. All legumes probably should have grass seeded with them to help conserve the

nitrogen fixed by the legumes, and all pasture-grass mixtures should contain legumes to supply the nitrogen needed by the grasses.

A suitable rotation for these soils is wheat, grass and legumes for 3 years, corn, and cotton. A 4-year rotation consists of wheat or other small grain, red clover, corn followed by a cover crop, and soybeans. A 3-year rotation of small grains, lespedeza, and corn is also suitable. In these rotations, barley, rye, or oats can be substituted for wheat, and sorgo, cotton, or sweetpotatoes can be substituted for corn. Vetch or crimson clover can be used for the cover crop, but vetch is apparently better suited to these soils.

Fertilization and liming are very important. All crops respond to phosphorus and possibly to potassium. All crops except the legumes need nitrogen, which generally is best obtained by the proper growth and use of legumes. Nitrogen fertilizers sometimes may be profitably used on cash crops and as a top dressing on the small grains. Lime and phosphorus are essential for the legume crops and will benefit all other crops following in the rotation.

If other management practices are good, special practices for runoff and erosion control should not be necessary. All tillage, however, should be on the contour insofar as practicable. Also, cover crops should follow all clean-cultivated crops.

The soils of this group are suited to pasture, but yields are not very high because the soils are low in both water-holding capacity and fertility. Pastures can be greatly improved by proper fertilization and seeding. Lime and phosphorus are required to establish and maintain good grazing. With proper fertilization, a mixture of orchard grass, tall fescue, white clover, red clover, and lespedeza is well suited. Periodic mowing is necessary to control weeds. Grazing must be controlled so as to maintain a good sod at all times.

MANAGEMENT GROUP 11—ROLLING MODERATELY WELL DRAINED BROWNISH-YELLOW FRIABLE SILT PAN SOILS OF THE TERRACE AND UPLANDS (NOT SEVERELY ERODED)

Bodine silt loam, eroded rolling phase.	Freeland silt loam, rolling phase.
Bodine silt loam, rolling phase.	Paden silt loam, eroded rolling phase.
Dickson silt loam, eroded rolling phase.	Paden silt loam, rolling phase.
Dickson silt loam, rolling phase.	Savannah loam, eroded rolling phase.
Dulac silt loam, eroded rolling phase.	Savannah loam, rolling phase.
Dulac silt loam, rolling phase.	Tippah silt loam, eroded rolling phase.
Freeland silt loam, eroded rolling phase.	Tippah silt loam, rolling phase.

Management requirements for soils of group 11 are more exacting than those for group 10, chiefly because slopes are stronger, or in the 5- to 15-percent range. The soils are low in organic matter and plant nutrients and strongly to very strongly acid. All have silt pans that interfere with water movement and restrict root penetration. Low fertility, low water-holding capacity, and a silt pan make these soils relatively low in productivity and limit their use suitability. They are fairly well suited to cotton, corn, small grains, sericea lespedeza, sweetpotatoes, and other crops commonly grown in the county. They are apparently better suited to small grains than to corn. Without special fertilization they are very poorly suited to red clover, alfalfa, and sweetclover. Even under the best of management, a stand of alfalfa is often difficult to maintain.

Management requirements.—The soils of group 11 are highly susceptible to erosion and to great injury from erosion; consequently, in most places, a long rotation consisting largely of close-growing crops

is desirable. A rotation that appears suitable is wheat, grass and legumes for 3 years, and corn. If alfalfa, sericea, or sweetclover is the legume crop, it is probably advisable to allow it to remain 4 years if the stand can be maintained. In the rotation mentioned, barley, rye, or oats can be substituted for wheat, and sorgo, cotton, or sweet-potatoes may replace the corn.

Fertilization and liming are very important if yields are to be maintained or increased. The soils are low in all major fertilizing elements, including lime. Management must be concerned with supplying adequate quantities of these for growing crops. Phosphorus and most of the potash must be supplied in commercial fertilizers. Barnyard manure is an important source of nitrogen, potash, and organic matter. Nitrogen generally can be more cheaply obtained by growing and properly using legumes. Nitrogen fertilizers are sometimes profitably used on cash crops and as a top dressing for small grains. Lespedeza and sericea are grown without amendments, but amendments are necessary for best results. Red clover must have lime, phosphorus, and potash.

Management should be particularly concerned with control of runoff and erosion. Proper selection and rotation of crops, together with the use of soil amendments, will partially control runoff, but some special practices are needed in many places. Contour tillage is an effective aid, and strip cropping of the longer slopes is advisable. In some places properly planned, constructed, and maintained terraces are also effective.

The soils of this group are suited to pasture, but yields are low chiefly because of low fertility and low water-holding capacity. Pastures can be greatly improved by proper fertilization and seeding. Lime and phosphate are required to establish and maintain good pastures. With proper fertilization a mixture of orchard grass, red-top, tall fescue, white clover, red clover, and lespedeza is well suited. Grazing should be carefully controlled to maintain a good sod; periodic mowing is necessary to control weeds.

MANAGEMENT GROUP 12—ROLLING WELL-DRAINED FRIABLE RED SOILS OF THE TERRACE LANDS (SEVERELY ERODED)

Dexter silty clay loam, severely eroded. Pickwick silty clay loam, severely eroded rolling phase.

Management group 12 is composed of well-drained soils severely injured by erosion and highly susceptible to further injury by accelerated erosion. They are low in organic matter and plant nutrients, especially nitrogen, but much more permeable than the severely eroded soils of group 19. Their water-holding capacity is higher than that of severely eroded soils but relatively low compared to that of the uneroded soils.

The soils of this group are poor to fair for crops and fair for pasture. If properly fertilized they will grow practically all common crops of the county successfully, though yields may be very low for one or two rotation periods. In their present condition, these soils are poorly suited to tilled crops and on most farms they probably are best used for pasture or semipermanent hay.

Management requirements.—If these soils are to be used for crops, a long rotation that includes as many close-growing crops as feasible

is desirable. A rotation of wheat, clover and grass for 3 years, and corn is suitable if the soils are properly fertilized. In this rotation any one of the small grains may be substituted for the wheat, and sorgo, cotton, or sweetpotatoes may replace the corn.

Soils of this group respond very well to fertilizers, especially to nitrogen and phosphorus. Lespedeza and sericea are grown without fertilizer, but lime and phosphate are necessary for the successful growth of red clover, alfalfa, or sweetclover. All legumes respond readily to the application of lime and phosphate. Barnyard manure is very beneficial in establishing a stand of the small-seeded crops on galled spots. It also supplies much needed nitrogen and organic matter, as well as some potash. A profitable response is obtained in most places by using a complete fertilizer on small grains, cotton, corn, and sweetpotatoes. If the legume crop is properly fertilized and inoculated, however, it will probably fix enough nitrogen for most crops in the rotation. The organic-matter supply is very low, and good management will be concerned with increasing and maintaining it at a higher level. The turning under of green-manure crops, growing of fibrous-rooted grass crops, and the use of manure will aid in increasing the organic-matter content.

Accelerated erosion has impaired the tilth of these soils and they now have a narrow range of moisture conditions in which they can be tilled. Practices designed to increase the organic-matter supply and to maintain more uniform moisture conditions will tend to improve tilth. If the soils are kept in pasture or semipermanent hay, special measures for runoff control may not be necessary. Terraces may be helpful in stabilizing erosion during the early part of an improved management program, especially if gullies are common. Terraces presumably would be needed if intertilled crops were to be grown. The soils are permeable and on fairly regular slopes and terraces; therefore they are relatively easy to maintain.

Fair to good pastures can be established and maintained, but liming and fertilization are necessary in most places. A good response is expected for lime, phosphate, and possibly potash. Nitrogen may be needed to establish a stand of pasture plants, but legumes in the mixture should fix most of the nitrogen needed, once the pasture is established. Relatively close grazing will favor the legumes at the expense of the grass, and periodic clipping of uneaten herbage has a similar effect. Clipping will also aid in the control of weeds. Droppings should be scattered to provide uniform distribution of the potash and nitrogen they contain.

MANAGEMENT GROUP 13—EXCESSIVELY DRAINED SOILS OF THE BOTTOM LANDS

In management group 13 is Bruno loamy fine sand, an excessively drained first-bottom soil subject to periodic overflow. It is moderate to low in organic matter and plant nutrients. Internal drainage is rapid to very rapid, and the water-holding capacity is very low. The use suitability of the soil is limited by susceptibility to overflow. It is fairly well suited to corn, peanuts, lespedeza, soybeans, and many other hay and forage crops.

Management requirements.—The management of this soil is concerned chiefly with the selection of drought-resistant crops and the addition of needed fertilizers, especially nitrogen. A short rotation—

corn the first year and lespedeza for 2 years following—is suitable. Peanuts can be substituted for the corn in the rotations, and soybeans or cowpeas for the lespedeza. All the crops should respond well to phosphorus and nitrogen. The legume crop should supply adequate nitrogen for other crops in the rotation.

This soil can be cultivated over a very wide range in moisture conditions. Tillage, especially with a tractor, is difficult because of the loose sandy surface layer.

This soil is poorly suited to pasture, chiefly because of its low water-holding capacity and low fertility. Also, it is associated with soils seldom used for pasture.

MANAGEMENT GROUP 14—NEARLY LEVEL IMPERFECTLY DRAINED FRIABLE SILTPAN SOILS OF THE TERRACE LANDS

Hatchie fine sandy loam.
Hatchie silt loam.

Taft silt loam.

The soils of management group 14 are poor to fair for crops and fair to good for pasture. They have moderate productivity and good conservability and workability but are imperfectly drained because of a hardpan layer at a depth of about 2 feet. They absorb moisture readily, but their hardpan layer restricts water movement; consequently, they are alternately wet and dry. Moisture conditions for growing crops are moderately unfavorable; crops are damaged by both excessive moisture and drought. The soils are strongly to very strongly acid and low in organic matter and plant nutrients. Imperfect drainage, low water-holding capacity, and a siltpan that restricts root penetration limit the use suitability of these soils. They are not well suited to deep-rooted legumes, cotton, sweetpotatoes, or any of the winter crops such as small grains, crimson clover, or vetch. They are fairly well suited to sorghum, lespedeza, and soybeans.

Management requirements.—Management of these soils is concerned chiefly with selection of crops suited to alternate wetness and dryness, the supplying of needed amendments, and the improving of drainage to increase suitability. Apparently 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 and redtop and alsike clover or lespedeza for 2 years is well suited. A crop of soybeans can be substituted for the corn, and white clover or sericea for the clover. If demand for row crops is great, they can be grown successfully in alternate years if the soils are carefully managed in other respects.

In general, these soils are deficient in lime, phosphorus, potash, and nitrogen. Corn and small grains need complete fertilizers. Legumes and legume-grass mixtures for hay or pasture need phosphorus and potash, but no nitrogen if they are properly inoculated. Lime is essential to success with legumes, and all crops in the rotation will be benefited by its use.

Plowing and other tillage may be delayed in spring because of unfavorable moisture conditions, but otherwise all operations can be accomplished easily on these soils. None is susceptible to serious erosion. Probably some measures for improving surface drainage can be used profitably. Unless tile can be laid above the hardpan, tile draining probably would not be effective. A combination of open ditches and bedding possibly would be the best method of improving drainage.

These soils are fairly well suited to pasture, although they are too droughty during many summer and fall seasons to furnish good grazing. Liming and fertilization are very necessary for establishing good pastures. Some mixture of white clover, lespedeza, redtop, and tall fescue is considered suitable.

MANAGEMENT GROUP 15—PLASTIC RED SOILS OF THE LIMESTONE UPLANDS ON GENTLE TO MODERATE SLOPES, NOT SEVERELY ERODED

Talbott silt loam, rolling phase.	Talbott silty clay loam, eroded undulating phase.
Talbott silty clay loam, eroded rolling phase.	Talbott stony silt loam, rolling phase.

Management group 15 is composed of heavy-textured soils on the undulating to rolling uplands. All are highly susceptible to erosion, and some are moderately eroded. The soils range from medium to strongly acid and from moderately high to low in organic matter and most plant nutrients. The present content of organic matter and plant nutrients, especially nitrogen, depends largely on the cropping system that has been practiced and the loss of soil material through erosion. The average depth to bedrock is about 5 feet, but bedrock crops out in most areas and in some places interferes materially with cultivation. The soils are poor to fair for crops but usually good for pasture. They are physically suited to most of the common crops grown in the county, and with lime and phosphate they will produce good yields of deep-rooted legumes.

Management requirements.—The rate of runoff is high on these soils, and a cropping system that will aid in checking runoff and make the best use of water is needed. In most areas a row crop can be safely grown once in 3 or 4 years if other management requirements are met. A rotation of corn, small grain, and sweetclover is suitable. Alfalfa can be substituted for sweetclover in a rotation lengthened to accommodate a longer period in hay. The deep-rooted legume crops are desirable because they improve the physical condition of the soil and help maintain its supplies of organic matter and nitrogen. Green-manure crops, as crimson clover, vetch, and small grains, can be used to good advantage for the same purpose.

Rotations such as that suggested above generally require liming and an application of phosphorus for the hay crop. Legumes are commonly difficult to establish, and application of manure is generally helpful in obtaining stands on eroded spots. The legume crop generally supplies adequate nitrogen for other crops in the rotation. The available supply of potash is generally adequate for all except high-yielding deep-rooted legume crops such as alfalfa.

Tillage can be performed over a very narrow range of moisture content on the eroded soils of this group, but good tilth is easily maintained on the uneroded soils. Tillage should be on the contour, if at all feasible, to help control runoff. Terracing is generally not advisable on the heavy-textured soils, but strip cropping on the longer slopes may be desirable.

Good pastures can be established and maintained on these soils, and on many farms the soils probably are best used for pasture. A good sod-forming pasture mixture should be seeded. If properly limed and fertilized, a mixture of bluegrass, orchard grass, white clover, red clover, and lespedeza is suitable. Moderately close graz-

ing and clipping will encourage legumes at the expense of the grasses and thus maintain a better supply of nitrogen. Droppings should be scattered.

MANAGEMENT GROUP 16—ROLLING FINE SANDY LOAMS AND CHERTY SILT LOAMS OF THE UPLANDS AND MODERATELY ERODED ROLLING CLAY LOAMS OF THE COASTAL PLAIN UPLANDS

Bodine cherty silt loam, rolling phase.	Shubuta-Savannah clay loams, eroded rolling phases.
Shubuta-Luverne clay loams, eroded rolling phases.	Shubuta-Savannah fine sandy loams, rolling phases.
Shubuta-Luverne fine sandy loams, rolling phases.	

The soils of management group 16 are poor to fair for crops and fair to good for pasture. Though fairly well suited to crops in physical properties, they are associated with Fifth-class soils on narrow winding ridge crests and therefore cannot be cultivated in many places. All the soils have very poor tilth, especially after they are eroded. The Bodine soils contain much chert and the Shubuta soils have a heavy-textured plastic subsoil. All soils except the Bodine are very susceptible to erosion and to great injury from erosion. The content of organic matter and plant nutrients is variable. All the soils are strongly to very strongly acid.

Management requirements.—If these soils are to be cropped, the rotation should be long, consist largely of close-growing crops, and include legumes and grasses. A suitable rotation is wheat, a legume and grass mixture for 3 years, and corn. Other small grains could be substituted for the wheat and cotton; soybeans or other row crops may replace the corn. It is especially important that a cover crop follow each clean-cultivated crop.

The need for fertilizer varies greatly with the different soils of this group, but all are deficient in lime and some fertilizing elements. All crops will respond to phosphorus and nitrogen, and possibly to potash. Lime and phosphorus are essential for the legume crops. Nitrogen is probably most economically supplied by including properly inoculated legumes in the rotation. Barnyard manure is an excellent source of nitrogen and potash. Also, the organic matter applied in the manure greatly aids in improving the tilth.

Favorable tilth is moderately difficult to maintain, and the range of moisture conditions favorable for tillage is relatively narrow. If the soils are plowed in fall, tilth will likely be improved by freezing and thawing, but this advantage is more than offset by increased erosion. Where the soils are in close-growing grass and small grain crops much of the time, runoff and erosion are greatly reduced, but further measures are generally required. Contour tillage should be practiced wherever possible. Terraces are generally not practicable on these soils.

All of these soils are fairly well suited to pasture. Tall fescue, orchard grass, redtop, white clover, and lespedeza are suited. Bermuda grass may be used to advantage in some places as a permanent pasture sod. Lime and phosphorus are needed to establish good pastures, and additional supplies are needed periodically to maintain a good stand. Very careful control of grazing is necessary, especially during dry seasons, to avoid injury to pasture stands. Clipping is necessary to eradicate weeds.

MANAGEMENT GROUP 17—HILLY WELL-DRAINED FRIABLE RED SOILS OF THE TERRACE LANDS

Dexter silt loam, hilly phase. Pickwick silt loam, hilly phase.
 Dexter silty clay loam, severely eroded Pickwick silty clay loam, severely
 hilly phase. eroded hilly phase.
 Pickwick silt loam, eroded hilly phase. Waynesboro fine sandy loam.

The soils of management group 17 are poor for crops and poor to good for pasture. They have low to moderate productivity and poor to fair conservability and workability. They differ from the soils of group 4 chiefly in having stronger slopes and in being generally somewhat more eroded. Slopes range from 12 to 30 percent.

All the soils have some deficiencies in lime, phosphorus, potassium, and organic matter. All except the severely eroded soils have light textures and are easily maintained in good tilth. Water is readily absorbed and retained except on the more severely eroded areas, but crops are injured by droughts of moderate duration because loss of water through runoff is large. High susceptibility to erosion makes pasture the best use for these soils on most farms, though they are physically suitable for crops under a high level of management.

Management requirements.—If these soils are used for crops, their management requirements will be very exacting. Rapid runoff leaves a moderately low supply of moisture for growing plants, and erosion is difficult to control. A long rotation consisting chiefly of close-growing crops is desirable. Correcting the deficiencies in plant nutrients not only increases crop yields but also provides better protection from erosion by encouraging more vigorous plant growth.

This group of soils is suited to pasture, but less well suited than those of group 4. Soil moisture conditions are relatively poor because of the rapid runoff. Grazing should be carefully controlled during droughts to prevent injury to pasture stands that would lead to denuding of the soils and greatly increased susceptibility to erosion. Lime and phosphorus are needed to correct soil deficiencies and to establish and maintain high-producing pastures. Scattering of droppings will be partly effective in maintaining the supply of potassium, but additional quantities may be needed. If properly limed and fertilized, Bermuda grass, orchard grass, white clover, and lespedeza are among the pasture plants that may do fairly well. Control of weeds will be accomplished largely through correct use of amendments and properly controlled grazing, but clipping a few times each year is advisable.

MANAGEMENT GROUP 18—POORLY DRAINED GRAY SOILS OF THE TERRACE AND BOTTOM LANDS

Almo silt loam. Melvin silt loam.
 Beechy fine sandy loam. Robertsville silt loam.
 Beechy silt loam.

The soils of management group 18 are poorly suited to crops but fair to very good for pasture. All are poorly drained and occupy nearly level to slightly depressed areas. The Melvin and Beechy soils are on stream bottoms; the Robertsville and Almo, on stream terraces. The Robertsville and Almo soils are low in fertility and strongly to very strongly acid; the Melvin and Beechy vary considerably in both fertility and reaction.

Under natural drainage these soils are poorly suited to tilled crops. They are suitable for pasture, though the Almo and Robertsville soils have relatively low productivity for pasture plants. The soils would be improved by artificial drainage. If they were adequately drained, they would be suitable for crops requiring tillage, but draining the Almo and Robertsville soils is beset with difficulties and is of doubtful practicability.

Management requirements.—Soils of management group 18 furnish pasture throughout spring, summer, and fall, but the quality is poor to fair and the carrying capacity is low to medium. The first step toward pasture improvement should be that of improving moisture conditions, which can be done largely by the digging of open ditches to remove surplus surface water. After drainage has been improved, seedings of tall fescue, white clover, redtop, lespedeza, and Bermuda grass can be expected to do fairly well if lime and phosphate are used. Redtop and lespedeza can be grown without amendments, but pastures are of lower quality than if amendments are applied. Weeds should be controlled by grazing and mowing.

Though generally poorly suited to crops requiring tillage, these soils are good to excellent for sorghum for sirup. If planted late in spring and harvested just before frost, only an occasional crop is lost as a result of excessive moisture or flooding. In most places a good response is obtained from a complete fertilizer. These soils, especially those of the first bottoms, are fairly well suited to soybeans for hay.

MANAGEMENT GROUP 19—ROLLING MODERATELY WELL DRAINED BROWNISH-YELLOW FRIABLE SILTPAN SOILS OF THE TERRACES AND UPLANDS (SEVERELY ERODED)

Bodine silty clay loam, severely eroded rolling phase.	Freeland silty clay loam, severely eroded rolling phase.
Dickson silty clay loam, severely eroded rolling phase.	Paden silty clay loam, severely eroded rolling phase.
Dulac silty clay loam, severely eroded rolling phase.	Savannah clay loam, severely eroded rolling phase.

The soils of management group 19 are poorly suited to crops requiring tillage, chiefly because they have been injured by erosion and are susceptible to further erosion. They are very low in organic matter, plant nutrients, and water-holding capacity. In their present condition they are probably best used for pasture or forest on most farms.

Management requirements.—If soils of group 19 are used for pasture and the pasture is already established, management requirements consist chiefly of periodic applications of lime, phosphate, and possibly potash and the control of weeds. Occasional reseeding may be necessary, but if fertilization is adequate, grazing is properly controlled, and weeds are systematically eradicated, reseeding should not be necessary and the pastures can be expected to improve with age. If the pastures are not yet established, the soils present a difficult problem in management. The establishment of pastures on these soils is difficult largely because of their poor tilth, tendency to clod and bake, slow moisture absorption, low water-holding capacity, and extreme deficiency in organic matter and plant nutrients. Where the soils are gullied check dams may be necessary, or diversion ditches or terraces may be advisable. Lime, phosphate, and possibly potash are necessary. Nitrogen probably will be required to get vegetation

established. Pasture mixtures containing a considerable percentage of drought-resistant plants should be seeded.

After a few years in well-managed pasture these soils may become suitable for crops. If so, the management requirements would be similar to those for soils of group 11.

MANAGEMENT GROUP 20—STONY ROLLING MODERATELY ERODED PLASTIC RED SOILS; NONSTONY ROLLING SEVERELY ERODED PLASTIC RED SOILS; AND HILLY PLASTIC RED AND YELLOW SOILS OF MODERATE FERTILITY, NOT SEVERELY ERODED

Inman silt loam, hilly phase.	Talbott silty clay loam, severely eroded rolling phase.
Inman silty clay loam, eroded hilly phase.	Talbott stony silt loam, hilly phase.
Safford very fine sandy loam, hilly phase.	Talbott stony silty clay loam, eroded hilly phase.
Talbott silt loam, hilly phase.	Talbott stony silty clay loam, eroded rolling phase.
Talbott silty clay loam, eroded hilly phase.	Talbott stony silty clay loam, severely eroded rolling phase.

The soils of management group 20 are poorly suited to crops requiring tillage because of severe erosion, strong slopes, stoniness, poor tilth, susceptibility to erosion, or some combination of these. On most farms they are probably best used and managed for pasture. Compared with other upland soils in the county, they are good for pasture. As a group they have moderate productivity but poor workability and conservability. They are fairly well supplied with lime and mineral plant nutrients. They have only fair moisture absorption because of their heavy-textured soil material, and plants are therefore injured by droughts.

Management requirements.—In some places it may be most profitable to use soils of group 20 in their natural conditions, but in most areas more intensive management is desirable. Seeding to a good pasture mixture that includes bluegrass and white clover will aid in pasture improvement. Applications of lime and phosphate will increase the proportion of white clover in the stand and produce a higher quality, higher yielding pasture. In places potash may be needed to establish good pastures, but once pasture is established, additional potash probably will not be needed if droppings are scattered. The Safford soils are high in potassium, and the Inman soils are high in phosphorus. They do not need these respective elements in their fertilizers. Use of lime and fertilizer coupled with carefully controlled grazing will eliminate most weeds, but mowing may be necessary. In some places outcrops may be high enough to interfere greatly with the use of a mowing machine. Even under good management, the carrying capacity of pastures on these soils is greatly reduced during dry summer and fall months.

MANAGEMENT GROUP 21—HILLY, CHERTY, OR GRAVELLY FRIABLE BROWN OR YELLOW SOILS OF THE TERRACES AND UPLANDS (NOT SEVERELY ERODED)

Bodine cherty silt loam, eroded hilly phase.	Bodine silt loam, hilly phase.
Bodine cherty silt loam, hilly phase.	Etowah gravelly silt loam, eroded hilly phase.
Bodine silt loam, eroded hilly phase.	Etowah gravelly silt loam, hilly phase.

High chert or gravel content, strong slopes, low fertility, poor tilth, susceptibility to erosion, or combinations of these unfavorable char-

acteristics make the soils of group 21 poorly suitable for crops requiring tillage. They are probably best used and managed for pasture.

Management requirements.—Soils of group 21 are not naturally productive of pasture, but good pastures could be established and maintained under good management. Some of the soils will need lime, phosphate, and possibly potash if pasture is to be established. Nitrogen may also be necessary. If properly fertilized, the soils are suited to bluegrass, orchard grass, redtop, white clover, red clover, hop clover, and lespedeza. Bermuda grass can be used to advantage in many places. Grazing must be carefully controlled to maintain a good sod at all times. Periodic application of lime and phosphate will also be necessary. Clipping of pastures to control weeds will be needed but will be difficult to accomplish on many of the soils.

MANAGEMENT GROUP 22—STEEP SOILS, SEVERELY ERODED HILLY SOILS, LITTLE ERODED OR MODERATELY ERODED HILLY SOILS OF LOW FERTILITY, ROLLING VERY STRONGLY PLASTIC SOILS OF LOW FERTILITY, AND MISCELLANEOUS LAND TYPES

Bodine cherty silt loam, severely eroded hilly phase.	Rough gullied land (Freeland and Paden soil materials).
Bodine cherty silt loam, steep phase.	Rough gullied land (Savannah and Ruston soil materials).
Cuthbert-Luverne clay loams, eroded hilly phases.	Rough gullied land (Talbot soil material).
Cuthbert-Luverne clay loams, severely eroded hilly phases.	Rough gullied land (Tippah and Dulac soil materials).
Cuthbert-Luverne fine sandy loams, hilly phases.	Ruston fine sandy loam, eroded hilly phase.
Cuthbert-Savannah clay loams, eroded hilly phases.	Ruston fine sandy loam, hilly phase.
Cuthbert-Savannah clay loams, severely eroded hilly phases.	Ruston fine sandy loam, steep phase.
Cuthbert-Savannah fine sandy loams, hilly phases.	Ruston sandy clay loam, severely eroded hilly phase.
Etowah gravelly silt loam, severely eroded hilly phase.	Safford clay loam, severely eroded hilly phase.
Etowah gravelly silt loam, steep phase.	Shubuta-Savannah clay loams, severely eroded rolling phases.
Hilly stony land (Talbot and Colbert soil materials).	Susquehanna very fine sandy loam.
Rolling stony land (Talbot and Colbert soil materials).	Talbot silty clay loam, severely eroded hilly phase.
Rough gullied land (Cuthbert and Luverne soil materials).	Talbot stony silty clay loam, severely eroded hilly phase.
Rough gullied land (Etowah and Dexter soil materials).	Talbot stony silt loam, steep phase.
	Tippah silty clay loam, severely eroded rolling phase.

The soils of management group 22 have a combination of undesirable features such as steepness and chertiness, steepness and stoniness, steepness and low fertility, low fertility and high susceptibility to erosion, and severe erosion. They are unsuitable for crops and very poorly suitable for pasture. They are probably best used for forestry on most farms.

Management requirements.—At present, little can be said about soil management practices for forest production, particularly from the farmer's point of view. For this reason, the soils of group 22, suited only to forest, have not been subdivided into groups according to soil management requirements and responses.

Most of these soils are now in forest; those that are not should be reforested. In places a suitable forest cover will establish itself if it is properly protected against fire and grazing. In others, planting will be necessary. Shortleaf pine is one of the species more suitable for planting on more exposed or otherwise less favorable

growing sites. On the better sites or places where moisture relations are more favorable for plant growth, black locust, poplar, and certain other deciduous trees are desirable.

Most of the management practices employed in the production of forest may be grouped as follows: (1) Maintenance of a full stand of desirable species, (2) systematic cutting and weeding of trees, (3) harvesting of the mature trees in such a manner that desirable species may succeed them, and (4) the control, so far as possible, of fires, browsing, trampling, and damage from other causes. Practices in the first three groups are strictly those of forest management, whereas those of the last group pertain to both soil and forest management.

TENNESSEE PUBLICATIONS RELATING TO SOIL MANAGEMENT REQUIREMENTS

The University of Tennessee Agricultural Experiment Station, and the Agricultural Extension Service have issued many publications, bulletins, and circulars that relate to the soils and crops of Tennessee. Some of the information in these publications is related to specific soils and crops, whereas much of it is of a more general nature and should be carefully studied before it is applied to any specific soil or crop. The materials in these publications have been freely used in the preparation of this report. The following list includes many of these publications.

Tennessee Agricultural Experiment Station publications:

Bulletins:

- 78, The Soils of Tennessee.
- 136, The Oat Crop.
- 141, The Comparative Values of Different Phosphates.
- 142, The Effect of Various Legumes on the Yield of Corn.
- 149, Fertilizers and Manure for Corn.
- 176, A New Explanation of What Happens to Superphosphate in Limed Soils.
- 191, Depth and Method of Soil Preparation and Cultivation for Corn and Cotton.
- 200, Effects of Lime, Fertilizer, and Preceding Legumes on the Yields of Corn and Tobacco.

Circulars:

- 5, The Soils of Tennessee.
- 6, The Value of Farmyard Manures.
- 10, A Select List of Varieties of Farm Crops.
- 11, Rates and Dates of Planting for Tennessee Farm and Garden Crops.
- 33, The Effect of Certain Soil Conditions on the Yield and Quality of Burley Tobacco.
- 34, Increasing the Profits from Phosphates for Tennessee Soils.
- 45, Balbo Rye.
- 49, Korean Lespedeza.
- 52, Rye for Pasture and Seed in Tennessee.
- 60, Fertilizers for Tennessee Soils.

Tennessee College of Agriculture Extension Service:

Publications:

- 133, Lime and Prosperity of the Farm.
- 144, The Farm Woodland in Tennessee.
- 161, Burley Tobacco Culture.
- 188, Winter Cover Crops for Pasture and Soil Conservation.
- 197, A Land Use and Soil Management Program for Tennessee.
- 208, Lime, Phosphate and Legumes in an Agricultural Conservation Program.
- 209, The Place of Terraces in Tennessee Agriculture.

Tennessee College of Agriculture Extension Service—Continued

Publications—Continued

- 210, Increasing Farm Returns; Some Principles of Farm Organization and Management.
- 213, Alfalfa in the Tennessee Farm Program.
- 214, Small Grain in the Contour Furrows on Lespedeza Sod.
- 216, Making High Quality Hay.
- 217, A Pasture Program for Tennessee Farms.
- 218, Farming Terraced Fields.
- 219, Plowing for Terrace Maintenance.
- 227, Field Mechanics of Terracing.
- 228, Terrace Outlet Waterways.
- 233, How to Build and Conserve Your Soil with the Aid of the AAA.
- 234, Conservation and Use of Manure on Tennessee Farms.
- 245, Planning the Farm Lay-Out and Cropping System.

Leaflet:

- 19, Soybean Seed Production in Tennessee.

Tennessee University, College of Agriculture:

Bulletins:

- 5, Determining Soil Types on Tennessee Farms.
- 6, Getting Acquainted with the Origin and Nature of Farm Soils in Tennessee.

In addition to the Tennessee publications the following were used:

- A Handbook of Agronomy, Extension Agronomy Department, Bulletin 97, Virginia Agricultural and Mechanical College and Polytechnic Institute.
- Kudzu, A Forage Crop for the Southeast, Leaflet 91, United States Department of Agriculture.

ESTIMATED YIELDS

Estimated average acre yields of principal crops under two levels of management are given in table 6 for each soil of the county. In columns A of this table are yields to be expected over a period of years under the management practices now prevailing on most farms. These practices are not the same on all soils, nor are they the same for any given soil in different parts of the area or on different farms. In general, however, they represent current management practices as described for the soils in the sections on Soils and Soil Use and Management.

The yields in columns A are based largely on observations made by members of the soil survey party, on information obtained by interviews with farmers and other agricultural workers who have had experience with the soils and crops of the area, and on comparisons with yields on similar soils in other counties in Tennessee. Specific crop yield data by soil types are not generally available, but it is believed that the estimates based on local experience are reasonable predictions of the yields that may be expected under the management commonly practiced. For some crops, yield information of any kind is very scarce. This is especially true of the yields of sorghum and vegetables and the carrying capacity of pastures.

In columns B are given the yields that may be expected under good management. Good management refers to the proper choice and rotation of crops, the correct use of commercial fertilizer, lime, and manure, proper tillage methods, the return of organic matter to the soil, and mechanical means of water control, all applied as necessary for the purpose of maintaining productivity or increasing it within practical limits, maintaining or improving workability, and conserving soil material, plant nutrients, and soil moisture.

TABLE 6.—Average acre yields¹ of principal crops to be expected over a period of years on the soils of Decatur County, Tenn.

[Yields in columns A are those to be expected under management prevailing on most farms; those in columns B are to be expected under good management.]

Soil	Corn		Cotton		Peanuts		Lespedeza hay		Soybean hay		Red clover		Sorghum		Pasture		Use suitability class
	A	B	A	B	A	B	A	B	A	B	A	B	A	B	A	B	
Almo silt loam.....	(9)	(9)	Lb.	(9)	Lb.	(9)	Tons	(9)	Tons	(9)	(9)	Tons	(9)	Gal.	(9)	Cow- acre- days	Fourth.
Alva fine sandy loam.....	30	30	420	420	800	900	0.4	1.0	0.8	1.0	0.8	1.0	60	90	25	50	First.
Beechy fine sandy loam.....	30	30	280	280	800	900	1.4	1.6	1.4	1.7	1.5	1.5	70	100	50	80	Fourth.
Beechy silt loam.....	(9)	(9)	(9)	(9)	(9)	(9)	.3	1.0	.8	1.2	(9)	(9)	70	110	60	90	Do.
Bodine cherty silt loam:							.4	1.2	.9	1.3	(9)	(9)	70	110	60	90	Do.
Eroded hilly phase.....	(9)	(9)	(9)	(9)	(9)	(9)	(9)	(9)	(9)	(9)	(9)	(9)	(9)	(9)	20	30	Do.
Hilly phase.....	(9)	(9)	(9)	(9)	(9)	(9)	(9)	(9)	(9)	(9)	(9)	(9)	(9)	(9)	25	40	Do.
Rolling phase.....	10	28	100	160	400	500	.4	.8	.4	.8	.8	.8	(9)	(9)	30	45	Third.
Severely eroded hilly phase.....	(9)	(9)	(9)	(9)	(9)	(9)	(9)	(9)	(9)	(9)	(9)	(9)	(9)	(9)	(9)	(9)	Fifth.
Steep phase.....	(9)	(9)	(9)	(9)	(9)	(9)	(9)	(9)	(9)	(9)	(9)	(9)	(9)	(9)	15	25	Do.
Bodine silt loam:																	Do.
Eroded hilly phase.....	(9)	(9)	(9)	(9)	(9)	(9)	(9)	(9)	(9)	(9)	(9)	(9)	(9)	(9)	25	40	Fourth.
Eroded rolling phase.....	14	30	200	320	400	500	.6	1.0	.5	1.0	.9	.9	(9)	(9)	30	45	Third.
Hilly phase.....	(9)	(9)	(9)	(9)	(9)	(9)	(9)	(9)	(9)	(9)	(9)	(9)	(9)	(9)	30	45	Fourth.
Rolling phase.....	16	35	220	350	500	600	.7	1.2	.6	1.2	1.0	1.0	(9)	(9)	35	50	Third.
Bodine silty clay loam, severely eroded rolling phase.....	(9)	(9)	(9)	(9)	(9)	(9)	(9)	(9)	(9)	(9)	(9)	(9)	(9)	(9)	15	25	Fourth.
Briensburg silt loam.....	25	46	240	380	800	1,000	1.1	1.2	1.1	1.5	(9)	(9)	80	90	80	120	Second.
Bruno fine sandy loam.....	35	55	350	450	800	1,000	1.5	1.7	1.6	2.0	(9)	(9)	(9)	(9)	100	110	Do.
Bruno loamy fine sand.....	18	35	350	450	500	600	.4	.7	.7	1.0	(9)	(9)	(9)	(9)	40	60	Third.
Cuthbert-Luverne clay loams:																	Do.
Eroded hilly phase.....	(9)	(9)	(9)	(9)	(9)	(9)	(9)	(9)	(9)	(9)	(9)	(9)	(9)	(9)	(9)	(9)	Fifth.
Severely eroded hilly phase.....	(9)	(9)	(9)	(9)	(9)	(9)	(9)	(9)	(9)	(9)	(9)	(9)	(9)	(9)	(9)	(9)	Do.
Cuthbert-Luverne fine sandy loams, hilly phases.....	(9)	(9)	(9)	(9)	(9)	(9)	(9)	(9)	(9)	(9)	(9)	(9)	(9)	(9)	(9)	(9)	Do.
Cuthbert-Savannah clay loams:																	Do.
Eroded hilly phase.....	(9)	(9)	(9)	(9)	(9)	(9)	(9)	(9)	(9)	(9)	(9)	(9)	(9)	(9)	(9)	(9)	Do.
Severely eroded hilly phase.....	(9)	(9)	(9)	(9)	(9)	(9)	(9)	(9)	(9)	(9)	(9)	(9)	(9)	(9)	(9)	(9)	Do.
Cuthbert-Savannah fine sandy loams, hilly phases.....	(9)	(9)	(9)	(9)	(9)	(9)	(9)	(9)	(9)	(9)	(9)	(9)	(9)	(9)	(9)	(9)	Do.
Dexter silt loam:																	Do.
Eroded rolling phase.....	22	45	280	420	600	800	1.0	1.6	.9	1.4	.5	1.5	50	70	80	120	Second.
Eroded undulating phase.....	25	50	320	480	750	900	1.2	1.8	1.0	1.6	.6	1.8	60	80	90	130	First.
Hilly phase.....	16	35	220	350	500	600	.7	1.2	.7	1.0	.5	1.2	50	70	35	55	Third.
Rolling phase.....	30	50	320	480	800	1,000	1.2	1.8	1.2	1.8	.8	2.0	70	100	90	130	First.

See footnotes at end of table.

TABLE 6.—Average acre yields¹ of principal crops to be expected over a period of years on the soils of Decatur County, Tenn.—Continued

[Yields in columns A are those to be expected under management prevailing on most farms; those in columns B are to be expected under good management]

Soil	Corn		Cotton		Peanuts		Lespedeza hay		Soybean hay		Red clover		Sorghum		Pasture		Use suitability class
	A	B	A	B	A	B	A	B	A	B	A	B	A	B	A	B	
	Ru. (t)	Ru. (t)	Lb. (t)	Lb. (t)	Lb. (t)	Lb. (t)	Tons (t)	Tons (t)	Tons (t)	Tons (t)	Tons (t)	Tons (t)	Gal. (t)	Gal. (t)	Cow- acre- days ²	Cow- acre- days ²	
Dexter silty clay loam:																	
Severely eroded hilly phase.....	14	30	160	240	(t)	(t)	.8	.8	.4	.8	(t)	(t)	(t)	(t)	20	30	Fourth.
Severely eroded rolling phase.....	(t)	(t)	(t)	(t)	(t)	(t)	(t)	(t)	(t)	(t)	(t)	(t)	(t)	(t)	35	55	Third.
Dickson silt loam:																	
Eroded rolling phase.....	16	35	220	380	400	500	.7	1.2	.5	1.0	.4	1.0	.50	60	40	70	Do.
Eroded undulating phase.....	18	40	240	400	600	800	.8	1.4	.6	1.3	.5	1.1	.70	80	50	80	Second.
Rolling phase.....	18	38	240	400	700	850	.8	1.4	.7	1.4	.6	1.2	.70	80	60	80	Do.
Undulating phase.....	20	43	260	440	750	900	.9	1.5	.7	1.5	.7	1.5	.80	90	60	100	Do.
Dickson silty clay loam, severely eroded rolling phase.....	(t)	25	(t)	120	(t)	(t)	.3	.6	(t)	(t)	(t)	(t)	(t)	(t)	15	25	Fourth.
Duac silt loam:																	
Eroded rolling phase.....	16	35	220	380	400	500	.7	1.2	.5	1.0	.4	1.0	.50	60	40	70	Third.
Eroded undulating phase.....	18	40	240	400	600	800	.8	1.4	.6	1.3	.5	1.1	.70	80	50	80	Second.
Rolling phase.....	18	38	240	400	700	850	.8	1.4	.7	1.4	.6	1.2	.70	80	60	100	Do.
Slightly eroded undulating phase.....	20	43	260	440	750	900	.9	1.5	.7	1.5	.7	1.5	.80	90	60	100	Do.
Undulating phase.....	20	43	260	440	750	900	.9	1.5	.7	1.5	.7	1.5	.80	90	60	100	Do.
Duac silty clay loam, severely eroded rolling phase.....	(t)	25	(t)	120	(t)	(t)	.3	.6	(t)	(t)	(t)	(t)	(t)	(t)	15	25	Fourth.
Egan silty clay loam.....	25	40	360	520	800	900	1.3	1.5	1.4	2.0	2.0	2.2	.60	80	70	90	Second.
Emory silt loam.....	40	65	360	520	800	900	1.6	1.8	1.7	2.2	2.0	2.2	.110	110	110	150	First.
Emus cherry silt loam.....	18	40	(t)	(t)	(t)	600	.8	1.4	1.0	1.5	.6	1.3	.70	80	70	90	Second.
Ennis silt loam.....	35	65	(t)	(t)	(t)	800	1.4	1.6	1.5	2.0	.8	2.0	.80	110	100	110	First.
Erowan gravelly silt loam:																	
Eroded hilly phase.....	(t)	(t)	(t)	(t)	(t)	(t)	(t)	(t)	(t)	(t)	(t)	(t)	(t)	(t)	20	30	Fourth.
Hilly phase.....	(t)	(t)	(t)	(t)	(t)	(t)	(t)	(t)	(t)	(t)	(t)	(t)	(t)	(t)	30	50	Do.
Severely eroded hilly phase.....	(t)	(t)	(t)	(t)	(t)	(t)	(t)	(t)	(t)	(t)	(t)	(t)	(t)	(t)	(t)	(t)	Fifth.
Steep phase.....	(t)	(t)	(t)	(t)	(t)	(t)	(t)	(t)	(t)	(t)	(t)	(t)	(t)	(t)	(t)	(t)	Do.
Eupora fine sandy loam.....	22	30	240	380	(t)	(t)	1.0	1.1	1.0	1.4	(t)	(t)	.70	80	70	110	Second.
Freedland silt loam:																	
Eroded rolling phase.....	16	35	220	380	400	500	.7	1.2	.5	1.0	.4	1.0	.50	60	40	70	Third.
Eroded undulating phase.....	18	40	240	400	600	800	.8	1.4	.6	1.3	.5	1.1	.70	80	50	80	Second.
Rolling phase.....	18	38	240	400	700	850	.8	1.4	.7	1.4	.6	1.2	.70	80	60	100	Do.
Undulated phase.....	20	43	260	440	750	900	.9	1.5	.7	1.5	.7	1.5	.80	90	60	100	Do.
Freedland silty clay loam, severely eroded rolling phase.....	(t)	25	(t)	120	(t)	(t)	.3	.6	(t)	(t)	(t)	(t)	(t)	(t)	15	25	Fourth.
Greendale cherry silt loam:																	
Rolling phase.....	20	35	(t)	(t)	500	700	.9	1.1	.8	1.2	.6	1.0	.50	70	70	90	Third.
Undulating phase.....	25	40	(t)	(t)	700	800	1.1	1.3	1.0	1.5	.8	1.3	.70	80	80	100	Second.

TABLE 6.—Average acre yields¹ of principal crops to be expected over a period of years on the soils of Decatur County, Tenn.—Continued

[Yields in columns A are those to be expected under management prevailing on most farms; those in columns B are to be expected under good management.]

Soil	Corn		Cotton		Peanuts		Lespedeza hay		Soybean hay		Red clover		Sorghum		Pasture		Use suitability class
	A	B	A	B	A	B	A	B	A	B	A	B	A	B	A	B	
Savannah loam:																	
Eroded rolling phase.....	16	35	Lb.	380	Lb.	500	Tons	1.2	Tons	.5	Tons	.4	Gal.	Gal.	40	80	Thrd.
Eroded undulating phase.....	18	40	240	400	600	800	.8	1.4	.6	1.3	.5	1.1	70	80	50	80	Second.
Rolling phase.....	18	38	240	400	700	850	.8	1.4	.6	1.4	.6	1.2	70	80	50	80	Do.
Undulating phase.....	20	43	260	440	750	900	.9	1.5	.7	1.5	.7	1.5	80	90	60	100	Do.
Sequestachie fine sandy loam.....	30	60	360	520	900	200	1.2	1.4	1.2	1.8	1.2	2.4	70	100	80	120	Frst.
Shannon fine sandy loam.....	30	60	360	520	900	200	1.2	1.4	1.2	1.8	1.2	2.4	70	100	80	120	Do.
Shannon silt loam.....	35	65	260	420	800	900	1.3	1.5	1.4	1.7	.9	1.6	70	100	70	90	Do.
Shubuta-Laverne clay loams, eroded rolling phases.....	(^{c})	(^{c})	(^{c})	(^{c})	(^{c})	(^c)	1.4	1.6	1.5	1.8	.8	1.6	70	100	80	100	Fourth.
Shubuta-Laverne fine sandy loams, rolling phases.....	(^c)	(^{c})	(^{c})	(^{c})	(^{c})	(^{c})	.4	.7	.4	.6	(^c)	(^c)	(^c)	(^c)	20	22	Thrd.
Shubuta-Savannah clay loams:	16	30	160	220	(^c)	(^c)	.5	.7	.4	.6	(^c)	(^c)	(^c)	(^c)	30	45	Fourth.
Eroded rolling phases.....	(^{c})	(^{c})	(^{c})	(^{c})	(^{c})	(^{c})	(^{c})	(^{c})	(^{c})	(^{c})	(^{c})	(^{c})	(^{c})	(^c)	20	25	Fourth.
Severely eroded rolling phases.....	(^{c})	(^{c})	(^{c})	(^{c})	(^{c})	(^{c})	(^{c})	(^{c})	(^{c})	(^{c})	(^{c})	(^{c})	(^{c})	(^{c})	(^{c})	(^c)	Fifth.
Shubuta-Savannah fine sandy loams, rolling phases.....	14	20	140	200	(^c)	(^c)	.4	.6	.4	.6	(^c)	(^c)	(^c)	(^c)	25	40	Thrd.
Susquehanna very fine sandy loam.....	(^c)	(^{c})	(^{c})	(^{c})	(^{c})	(^{c})	(^{c})	(^{c})	(^{c})	(^{c})	(^{c})	(^{c})	(^{c})	(^{c})	(^{c})	(^{c})	Fifth.
Tat silt loam.....	16	35	(^c)	(^c)	(^c)	(^c)	.7	1.4	.8	1.5	(^c)	1.2	70	80	50	80	Thrd.
Talbutt silt loam:																	
Hilly phase.....	(^{c})	(^{c})	(^{c})	(^{c})	(^{c})	(^{c})	(^{c})	(^{c})	(^{c})	(^{c})	(^{c})	(^{c})	(^{c})	(^c)	50	70	Fourth.
Rolling phase.....	25	40	260	420	500	600	1.3	1.5	.9	1.3	1.0	1.5	60	70	100	130	Second.
Talbutt silty clay loam:																	
Eroded hilly phase.....	(^{c})	(^{c})	(^{c})	(^{c})	(^{c})	(^{c})	(^{c})	(^{c})	(^{c})	(^{c})	(^{c})	(^{c})	(^{c})	(^c)	40	60	Fourth.
Eroded rolling phase.....	20	35	220	360	(^c)	(^c)	.9	1.4	.6	.8	.6	1.0	(^c)	(^c)	80	100	Thrd.
Eroded undulating phase.....	22	45	240	400	400	500	1.0	1.5	.7	1.0	.8	1.2	40	60	90	110	Second.
Severely eroded hilly phase.....	(^c)	(^{c})	(^{c})	(^{c})	(^{c})	(^{c})	(^{c})	(^{c})	(^{c})	(^{c})	(^{c})	(^{c})	(^{c})	(^{c})	(^{c})	(^{c})	Fifth.
Severely eroded rolling phase.....	(^{c})	(^{c})	(^{c})	(^{c})	(^{c})	(^{c})	(^{c})	(^{c})	(^{c})	(^{c})	(^{c})	(^{c})	(^{c})	(^c)	25	35	Do.
Talbutt stony silt loam:																	
Hilly phase.....	(^{c})	(^{c})	(^{c})	(^{c})	(^{c})	(^{c})	(^{c})	(^{c})	(^{c})	(^{c})	(^{c})	(^{c})	(^{c})	(^c)	40	60	Fourth.
Rolling phase.....	20	30	220	360	(^c)	(^c)	.9	1.4	.6	.8	.5	1.0	40	60	80	120	Thrd.
Sloep phase.....	(^c)	(^{c})	(^{c})	(^{c})	(^{c})	(^{c})	(^{c})	(^{c})	(^{c})	(^{c})	(^{c})	(^{c})	(^{c})	(^{c})	(^{c})	(^{c})	Fifth.
Talbutt stony silty clay loam:																	
Eroded hilly phase.....	(^{c})	(^{c})	(^{c})	(^{c})	(^{c})	(^{c})	(^{c})	(^{c})	(^{c})	(^{c})	(^{c})	(^{c})	(^{c})	(^c)	30	50	Fourth.
Eroded rolling phase.....	(^{c})	(^{c})	(^{c})	(^{c})	(^{c})	(^{c})	(^{c})	(^{c})	(^{c})	(^{c})	(^{c})	(^{c})	(^{c})	(^c)	70	90	Do.
Severely eroded hilly phase.....	(^c)	(^{c})	(^{c})	(^{c})	(^{c})	(^{c})	(^{c})	(^{c})	(^{c})	(^{c})	(^{c})	(^{c})	(^{c})	(^{c})	(^{c})	(^{c})	Fifth.
Severely eroded rolling phase.....	(^{c})	(^{c})	(^{c})	(^{c})	(^{c})	(^{c})	(^{c})	(^{c})	(^{c})	(^{c})	(^{c})	(^{c})	(^{c})	(^c)	20	30	Fourth.
Tigrett silt loam.....	35	60	300	480	600	800	1.5	1.8	1.5	1.8	1.5	1.2	70	100	80	100	Frst.

Present knowledge of the requirements of good management for specific soils planted to specific crops is limited, but some deficiencies of the soils are known with a reasonable degree of certainty. Based on this relatively limited information, some of the requirements for good management of individual soils are given in the section of the report where each soil is described, and in the section on Soil Uses and Management some management requirements are described for groups of soils having about the same management needs. The level of good management for an individual farm depends on circumstances peculiar to that farm, among which are its size and the type and the acreages of different kinds of soils on it. Requirements for good management of any particular soil therefore cannot be rigidly specified. Generally, however, the management suggestions made for the various management groups are those considered necessary to achieve the yields listed in columns B.

The expectable yields in columns B are based largely upon estimates of men who have had experience with the soils and crops. The factors considered in making these estimates are known deficiencies of the soil and increases in crop yields to be expected when these deficiencies are corrected within practical limits. Practical limits cannot be precisely defined, nor can the response to improved management practices be precisely predicted for a given crop on a given soil. Some unknown deficiency that is not being corrected, furthermore, may materially affect yields. The comparison of yields listed in columns B with those in columns A gives some idea of the responses that may be expected from good management. The yields in columns B can be used as production goals that may be attained by using good management practices now feasible. Intensive management will bring profitable increases in yields of almost all soils of the county.

SOIL ASSOCIATIONS ¹

Soils occur in characteristic positions on the landscape and in relatively characteristic geographic associations. The Hatchie soils, for example, occur on high terraces and are nearly always associated with the Freeland and Almo soils. The Huntington soils occur only in the stream bottoms and are generally associated with Linside soils of the bottoms and Wolftever soils of the low terraces.

By grouping soils that are geographically associated it is possible to prepare a generalized map that shows the areas dominated by each group of such associated soils. On such basis, the soils of Decatur County have been placed in nine groups called soil associations. Each association, or group, has fairly well defined geographic boundaries (fig. 3).

A soil association may consist of only a few soils or of many soils. The soils may be similar, or they may represent many differing types. Nevertheless, each soil association has a certain uniform soil pattern. Although soils are closely associated geographically, they are not necessarily similar in suitability for agricultural use. Unlike soils can occur side by side in close association.

¹ A soil association may be defined either as a group of soils occurring together in a characteristic pattern or as a landscape definable as to the kind, proportion, and distribution of its component soils.

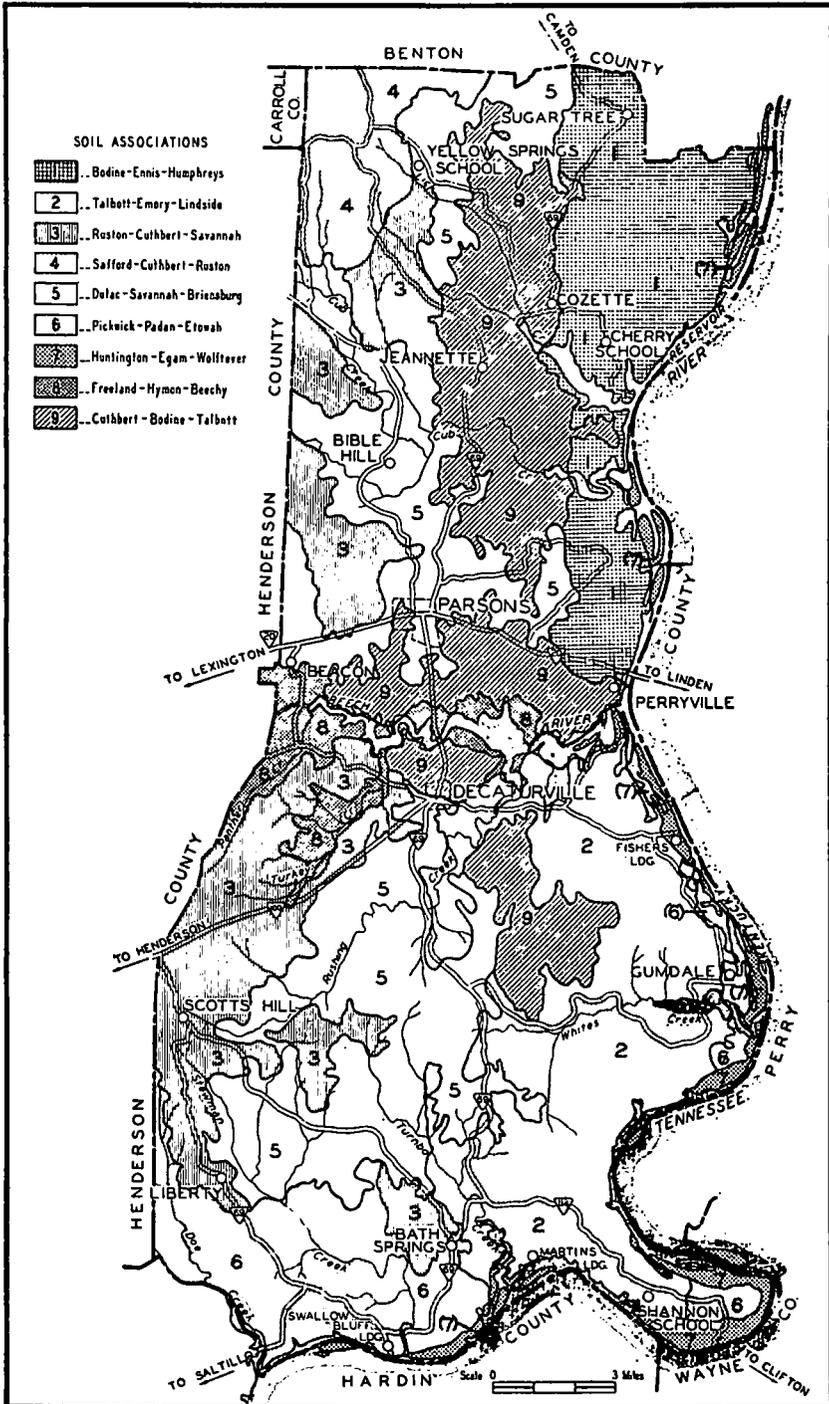


FIGURE 3.—Soil associations of Decatur County, Tenn.

The other soils with which a soil is associated may greatly influence its use and its relative importance to the agriculture of the area. A soil physically suitable for corn may or may not be used for corn, depending upon whether it is associated with soils suitable or poorly suitable for corn.

If a soil survey is to be used to advantage in broad land programs it is important to know not only detailed physical characteristics and use suitabilities of the various soils but also what soils occur together in broad areas. Knowledge of what soils occur together in an area is also useful in learning to identify the soils of the area, in understanding their distribution, and in interpreting and predicting their relationships to agriculture.

A brief discussion of each soil association area follows. More detailed information about the component soils of each association can be obtained from the discussion of each soil in the section on Soils.

BODINE-ENNIS-HUMPHREYS ASSOCIATION

The soils of the Bodine-Ennis-Humphreys association are in the highly dissected parts of the Limestone Hills section. The association is characterized by narrow winding ridges and deep steep-walled V-shaped valleys. Typical areas have Dickson soils on broader gently sloping ridge crests, steep Bodine soils on ridge slopes, Greendale soils, on sloping alluvial-colluvial fans, gently sloping Humphreys soil on low narrow stream terraces, and Ennis soils on the nearly level narrow stream bottoms.

In this association the Bodine soils are the most extensive, but the Ennis and Humphreys soils are more important agriculturally. Other soils of small extent but important to the agriculture of the area are the Dickson, Greendale, Lindside, and Melvin.

Most soils of the uplands in this area are Fourth- and Fifth-class soils, but those on the colluvial fans, terraces, and bottom lands are predominantly First- and Second-class soils. The total area of the First- and Second-class soils, however, is comparatively small.

The area covered by this association is large, but the total acreage of soils suited to crops is very small. The upland soils are predominantly members of the Bodine series, which because of steepness, chertiness, and low fertility, are unsuited to, or at best, very poorly suited to crops or pasture. The Dickson soils of the broader ridge crests are physically suitable for crops but somewhat isolated by the extensive areas of Fourth- and Fifth-class Bodine soils. Most of the crops and pasture are consequently on Ennis, Humphreys, and Greendale soils of the bottoms, terraces, and colluvial lands. These soils are moderately fertile and productive but in many places contain so many chert fragments that cultivation is difficult.

The type of farming in this association is influenced by adjacent bottom lands (Pickwick-Paden-Etowah association). A corn-hog type farming is followed on the creek-bottom soils; so little use is made of the adjacent upland soils of this association. An estimated 25 percent of the cleared land is used for corn. Lespedeza is the principal hay and pasture plant. Small acreages of peanuts, cotton, and sorghum are grown on the self-sufficing farms that characterize this area.

TALBOTT-EMORY-LINDSIDE ASSOCIATION

The Talbott-Emory-Lindsay association covers rolling to hilly areas with well-established drainage in the southeastern part of the county. Talbott soils are the most extensive in the uplands; Emory soil in the colluvial lands, and Lindsay soils in the bottom lands. The Maury, Inman, Huntington, and Melvin are other soils of small acreage but considerable importance to agriculture. Large areas of Rolling stony land (Talbott and Colbert soil materials) are distributed throughout the area. Bodine soils cap the ridges or occupy upper ridge slopes over most of the area but are most extensive along the western side.

Fourth- and Fifth-class soils are the most extensive in this association, but a considerable acreage of First- and Second-class soils is included. Stoniness, steepness, or poor tilth makes many of the upland soils poorly suited to crops, but most of them are suited to pasture. The Emory soil of the colluvial lands is highly productive and suited to intensive use for a wide variety of crops. The Lindsay soils of the bottom lands are productive of corn, hay, and other forage crops but their use suitability is limited by susceptibility to flooding and imperfect drainage.

The farms of this area are chiefly of the small general type. Cotton, hogs, and beef cattle are the chief sources of cash income. More cotton and fewer peanuts are grown than in the Bodine-Ennis-Humphreys association, and more cattle are raised. Corn, cotton, and lespezeza are the principal crops. Feed for livestock is grown chiefly on Lindsay soils. On most farms the pastures are on the poorly drained Melvin soil of the bottom lands or the Talbott soils of the uplands. The cotton crop is grown chiefly on the Emory soil or the less sloping Talbott soils.

RUSTON-CUTHBERT-SAVANNAH ASSOCIATION

The Ruston-Cuthbert-Savannah association is in the high dissected Coastal Plain section in the western part of the county. The topography is characterized by short steep slopes, narrow V-shaped valleys, and relatively broad flat flood plains along major streams. Savannah soils are on the ridge crests, Ruston or Cuthbert soils on the steep ridge slopes, Eupora soil on the sloping colluvial land, and Beechy soils on the bottom lands. The Luverne, Dulac, Tippah, Hymon, and Shannon are less extensive soils in the area.

The soils are poorly suited to crops or pasture. The extensive Ruston soils—steep, erodible and low in fertility—are not suitable for crops. Cleared areas of Ruston soils have been severely injured by erosion in most places. The Cuthbert soils are generally unsuited to crops because of low fertility, low water-holding capacity, poor tilth, and steep slopes. The Savannah soils are physically suitable for crops, but like the Ruston soils, have been severely injured by erosion in most places. The Beechy soils of the bottom lands are poorly drained and generally unsuitable for crops but fairly well suited to pasture. Most of the corn is produced on Beechy soils, though the crop is frequently damaged in extended wet seasons.

A subsistence type of farming is practiced. Cotton is the only cash crop of importance, though some corn and hay are sold. The sale of

veal calves from the family milk cow is probably one of the chief sources of livestock income in the area. Hogs and dairy products are a source of income, but the income received on any one farm from these is small. This association apparently contains a higher percentage of idle land or abandoned open land than any other association in the county.

SAFFORD-CUTHBERT-RUSTON ASSOCIATION

The Safford-Cuthbert-Ruston association has a higher percentage of woodland than any of the other associations. It is highly dissected, and the soils are intricately associated geographically. Members of the Cuthbert, Safford, Ruston, Dulac, Savannah, Briensburg, Hymon, and Beechy series are in the area. In most places Dulac soils are on ridge crests, Safford, Ruston, or Cuthbert soils on ridge slopes, Briensburg soils on colluvial lands, and Hymon soils on bottom lands.

The soils are generally poorly suited to crops. The Dulac soils are physically suited to crops but occur on narrow ridge tops in association with Fourth- and Fifth-class soils. The Cuthbert and Safford soils, steep and extremely susceptible to erosion, are not physically suited to crops. The Safford soils, however, are excellent for timber and probably would support good pasture. The Hymon and Briensburg soils of the bottoms and colluvial lands are suitable for crops, but imperfect drainage limits their use, and in the case of the Hymon soils, periodic overflow is also limiting. Fourth- and Fifth-class soils predominate in this area; most of the farming is on Second-class soils of the bottoms and colluvial lands.

Most farms of this area are of the subsistence type. Cotton is the major source of cash income. Various crops and livestock are produced, but mostly for home use. Forest products contribute a comparatively large amount to the income of the area.

DULAC-SAVANNAH-BRIENSBURG ASSOCIATION

The Dulac-Savannah-Briensburg association is on the undulating to rolling Loess Plain in the central part of the county. Most of the Dulac soils are on the undulating areas, the Savannah soils on undulating to rolling areas of the uplands, the Briensburg soil on the colluvial lands, and Hymon soils on the bottom lands. Less extensive soils are the Tippah, Cuthbert, Safford, Beechy, and Shannon.

Most soils of this area are suitable for crops. Second-class soils predominate, but Third- and Fourth-class soils cover a significant area. Erosion has notably injured many of the upland soils. The Dulac and Savannah soils are well suited to crops but low in fertility. The Hymon and Briensburg soils are imperfectly drained and consequently somewhat limited in crop adaptation. The Hymon soils are especially limited because they are also subject to periodic overflow.

The Dulac-Savannah-Briensburg association is characterized by small general farms. Cotton is the only cash crop of importance. The proportion of cleared land in corn is less than in other associations. Red clover, sericea, and crimson clover have been produced successfully on small areas, but they are generally not grown. Cattle, hogs, poultry, and dairy products are all important sources of income,

but the quantity sold from each farm is small. The agriculture is more diversified in this association than any other association except the Freeland-Hymon-Beechy.

PICKWICK-PADEN-ETOWAH ASSOCIATION

The Pickwick-Paden-Etowah association occurs on the old high terraces of the Tennessee River. The area is undulating to hilly. On most farms Paden soils are on undulating ridge crests, Pickwick soils on rolling ridge crests or ridge slopes, and Etowah soils on steeper ridge slopes. The Taft, Robertsville, Linside, and Melvin are less extensive soils but important to the agriculture of the area.

Second- and Third-class soils predominate, though a small but important acreage consists of First-class soils. The Paden soils, most extensive in the area, are physically suitable for crops but low in water-holding capacity, fertility, and productivity of most crops. The Pickwick soils are well suited to most crops of the county, relatively productive, and very responsive to good management. The Etowah soils are poorly suited to crops but in most areas are suitable for pasture. They are on the stronger slopes and are gravelly.

This association now supports a very small population. A general type of farming is practiced in which cotton is the chief cash crop. Few livestock are raised, but corn grown on the adjacent Huntington-Egam-Wolftever association is fed on many of the farms of this area. In fact, many of the farmers that live in this association farm in the Huntington-Egam-Wolftever association.

HUNTINGTON-EGAM-WOLFTEVER ASSOCIATION

The Huntington-Egam-Wolftever association is small and includes first bottoms and low terraces along the Tennessee River. The first bottoms and low terraces are somewhat undulating and consist of natural levees near the river banks and other low ridges and intervening swales or sloughs that run nearly parallel to the river. Bruno soils are on the high natural levees, Huntington soil is on the low first bottoms, and Egam soil is on the high bottoms. Linside and Melvin soils occur chiefly in the low swales. Sequatchie and Wolftever soils occur on the nearly level to undulating low terraces, and Taft and Robertsville soils on the level to slightly depressed areas in association with these soils. All of this area is subject to periodic overflow, though the low terraces overflow only at long intervals. Much of the area is flooded by the Kentucky Reservoir.

As a group, there are probably the most fertile and productive soils of the county, but chiefly because of periodic overflow they are somewhat limited in use suitability. Also, crops on certain of these soils, as the Egam and Wolftever, are very susceptible to drought. The poorly drained Melvin and Robertsville soils are not considered suitable for crops but are suitable for pasture.

This association has the highest percentage of cropland in the county and is characterized by a corn-hog type of farming. Corn, peanuts, and cotton are important sources of cash income. Hogs are by far the most important source of livestock income, but cattle, poultry, dairy products, and sheep are additional sources.

FREELAND-HYMON-BEECHY ASSOCIATION

The Freeland-Hymon-Beechy association consists of high terraces and bottom lands along the Beech River and tributary streams. It is weakly dissected and undulating to gently rolling. The Freeland, Briensburg, Hymon, and Beechy are the most extensive soils, though small areas of Dexter, Hatchie, Almo, Tigrett, and Shannon soils are included. A typical farm in this area has Dexter soils on the more strongly sloping areas, Freeland soils on the undulating to rolling areas, Hatchie soils on the gently sloping to nearly level areas, Almo soil on the level to slightly depressional areas, Briensburg soil on the colluvial land, and Hymon or Beechy soils on the bottom land.

Much of the area is well suited to crops. The use suitability of the Freeland soils—the most extensive in the association—is slightly restricted, and their productivity is moderately low because of restricted drainage and retarded root penetration. The use suitability of the Hymon and Briensburg soils is limited by imperfect drainage and susceptibility to overflow, but their productivity is comparatively high. The poorly drained Beechy soils are poorly suited to crops but good for pasture.

This is a diversified farming area. Hogs, cattle, poultry, and dairy products are the sources of livestock income; hogs and cattle supply most of the total. Corn is grown on the largest acreage, but cotton accounts for most of the cash income. The small general type of farm is most common.

CUTHBERT-BODINE-TALBOTT ASSOCIATION

The soils of the Cuthbert-Bodine-Talbott association occur along the contact line of two major physiographic divisions. Along this contact the geological formations are thin and several greatly different formations are exposed on the same slope; consequently, the soils are highly mixed. The association is transitional between the Bodine-Ennis-Humphreys and the Ruston-Cuthbert-Savannah associations and includes soils common to both. The Cuthbert, Bodine, and Talbott are the most extensive upland soils, and in places they may be on the same slope. Dulac, Savannah, or Dickson soils are on the ridge crests in most places. The imperfectly drained Lindside and Hymon soils are the most extensive in the bottom lands, though an appreciable acreage of well-drained Shannon and Ennis soils and poorly drained Melvin and Beechy soils also occurs. The Briensburg and Greensdale soils are on colluvial lands.

This association is predominantly hilly but not so deeply dissected as the Bodine-Ennis-Humphreys association. It has a larger proportionate acreage of undulating ridge tops than of bottom land. Crop and pasture land is largely confined to the smoother ridge crests and to the colluvial land and bottom land. The ridge slopes are chiefly in forest. The Dulac, Savannah, and Dickson soils of the ridge crests are suited to crops and pasture but have low fertility and low water-holding capacity and are therefore low in productivity. The Lindside and Hymon soils of the bottom lands are relatively productive of corn and hay and other forage crops, but their use suitability is limited by susceptibility to flooding and imperfect drainage.

The agriculture is diversified, but cotton and peanuts are the chief cash crops. Very few livestock other than work stock are raised. Most of the farms are of the small general type and subsistence type.

FORESTS ^s

When the first settlers arrived, all of the area now in Decatur County was heavily timbered, mainly with hardwoods, but in the southeastern part with numerous cedars and hardwoods. Pioneer farmers considered the timber a nuisance, not an asset. They needed productive land for crops, and much labor was required to clear it. They first cleared the most fertile soils and the areas of most suitable topography. As pressure of population increased the demand for cropland, they cleared the less desirable woodland. The pioneer needed timber only for fuel and construction of buildings, furniture, and fences, so he burned most of that he cut on the land.

Now, approximately 58 percent of the county is forested, and of this, 68 percent is farm woodland and 32 percent is private nonfarm forest. There are no public forests in the county. Based on the number of farms reporting in 1940, the average farm woodlot is slightly less than 73 acres in size. The land in forest is classified as 23 percent saw timber, 58 percent cordwood, and 19 percent below cordwood.

In 1942, 15 sawmills were operating in the county (pl. 6, A). In that year 1,685 M board feet of softwood and 6,696 M board feet of hardwood lumber were produced (pl. 6, B). No production of pulpwood or chestnut extract-wood was reported.

FOREST TYPES

The forests of Decatur County can be divided into six forest types: (1) upland hardwoods, (2) blackjack oak-hardwoods, (3) bottom-land hardwoods, (4) yellow pine-hardwoods, (5) cedar-hardwoods, and (6) oak-chestnut hardwoods. Upland hardwoods occupy about 88 percent of the timber-producing area; blackjack oak-hardwoods, 3 percent; bottom-land hardwoods, 2 percent; yellow pine-hardwoods, 5 percent; and cedar-hardwoods, 2 percent. The sixth forest type—the oak-chestnut hardwoods—occupies a very small acreage. The various forest types and their relation to soil associations of the county are separately discussed in the following paragraphs. The locations of the various soil associations mentioned are shown in figure 3, page 185; the soil associations are explained on pages 184 to 190.

Upland hardwoods.—In this forest type mixed oaks, hickories, yellow-poplar, blackgum, and basswood are conspicuous and produce merchantable timber except where damaged by fires and overgrazing. This forest type occupies all soil associations except those specifically mentioned as being occupied by other forest types or those used predominantly for crops. Among the associations it occupies is the Safford-Cuthbert-Ruston, which has a good stand of white oak and beech. Sound long-bodied stems indicate vigorous timber growth on this association. The preference of white oak and beech for the Safford soils is especially noticeable.

^sThis section prepared by G. B. Shivery, extension forester, University of Tennessee.

The Bodine-Ennis-Humphreys association is also predominantly forested with upland hardwoods. The ridge crests and upper slopes support low quality trees, chiefly blackjack, black, chestnut, and post oaks. The lower semi-colluvial parts of the slopes support good quality white and Southern red oaks and hickory. Forest fires, cutting of choice trees when of a size that will make only one cross tie, and livestock grazing have depleted the stand on most of the Bodine soils. The Cuthbert soils have a growth similar to that on the Bodine, but may also have sweetgum and yellow-poplar on lower slopes.

Blackjack oak-hardwoods.—This forest type occupies ridge crests in the Cuthbert-Bodine-Talbott soil association, primarily southeast of Decaturville. It is chiefly on Cuthbert soils but also on Bodine soils, especially on ridge crests of Bodine soils. The forest consists mainly of post, white, blackjack, and scarlet oaks, pignut hickory, and blackgum, but there are also sourwood, dogwood, red maple, and Southern red and chestnut oaks. The size and quality of the timber make it acceptable for cross ties rather than saw timber.

Bottom-land hardwoods.—This forest type is found on the Freeland-Hymon-Beechy soil association. It also occurs in the Pickwick-Paden-Etowah soil association along Doe and Stewman Creeks and around Bath Springs. Predominant species are redgum, blackgum, and tupelo-gum, willow, swamp white oak, water oak, swamp chestnut oak, green ash, sycamore, cypress, hackberry, red and silver maples, and elm.

Yellow pine-hardwoods.—In this forest type 25 to 75 percent of the total stems are pine. It occurs in the Clifton Bend area, not far from Clifton, which is in Wayne County. It is confined largely to ridge crests and upper ridge slopes.

Cedar-hardwoods.—This is a forest type in which 25 to 75 percent of the dominant and codominant stems are cedar. It occurs primarily on the Talbott-Emory-Lindside soil association. Small areas occur along Whites Creek, near Bath Springs, near Shannon School, and east of Decaturville.

Oak-chestnut hardwoods.—This forest type occurs chiefly on high ridges of Ruston soils about 4 miles west and southwest of Decaturville in the Ruston-Cuthbert-Savannah soil association. The total area of this forest type is very small, and the timber is of below-cordwood size (pl. 6, C).

SOILS AND FOREST SPECIES

The dominance of certain species on certain soils is important but not easily explained in a discussion of soil associations and broad forest types. Some of the correlations between species and soils are therefore mentioned. The Susquehanna soil, with its extremely heavy clay subsoil, supports a very poor growth consisting chiefly of blackjack and post oaks. The Tippah soils, with their siltpan, present difficult growing conditions and support mainly blackjack oak. Other siltpan soils—the Paden, Dulac, Savannah, Dickson, and Freeland—all have about the same kind of forest cover, primarily white, scarlet, post, and Southern red oaks. Cedars grow large on Talbott soils and stony land types. Willow, cypress, and tupelo-gum are found on poorly drained bottom soils such as the Melvin and Beechy. Ruston



A, Small portable sawmill for sawing lumber and cross ties mostly from small or rough cull logs passed by in previous cuttings.
B, Cross ties awaiting shipment by barge to processing centers.
C, Deciduous forest containing many dead chestnut trees on Ruston fine sandy loam, hilly phase.



A, Reforestation project on Rough gullied land (Cuthbert and Luverne soil materials). Black locust in foreground are a complete failure; pine in background have made fairly successful growth.

B, Natural reforestation with redcedar on Rough gullied land (Talbot soil material).

soils supported most of the chestnut trees before they were eliminated by disease. Yellow-poplar makes thriving growth on lower Ruston slopes, especially where there is a slight accumulation of colluvial material.

The correlations between soils and forest species are modified by direction and steepness of slope. These modifications are especially evident in the uplands, where relief varies considerably. The direction toward which a slope faces influences to marked degree the species in the stand and the composition and quality of the stand. A more vigorous growth having a higher percentage of more desirable species occurs on north- and east-facing slopes. Similar advantages to timber growth are noted for the lower parts of long slopes, where yellow-poplar, redgum, white and Southern red oaks, white and scalybark hickories, and blackgum are common. Superior species, composition of stand, and quality of timber characterize those positions having a more constant moisture supply.

FOREST MANAGEMENT

Much greater effort should be made to adopt management that will halt the progressive deterioration of forest resources. Greater emphasis must be placed on the potential crop of saw timber, and the indirect benefits of good forest cover must be considered more seriously, especially for those critical areas subject to erosion.

The merits of good forest cover in increasing moisture absorption and preventing erosion are worthy of special mention. A protective layer of forest litter absorbs the impact of falling raindrops and preserves the tiny pores and channels between soil particles through which water soaks downward. Fungi, bacteria, and tiny animals consume the forest litter and each other and eventually form humus, a dark-brown colloidal substance that is carried downward by percolating water and improves the mineral soil in structure and fertility. The litter and humus have, in addition, great capacity to absorb water directly. Porosity of the soil is further increased by the channels left after the decay of dead roots. The soil-binding function of the surface roots is of course highly beneficial. The densest network of roots is in the lower part of well-developed layers of litter.

Experiments have been conducted that show the effectiveness of forest cover in holding water on the soil and in controlling erosion. Results obtained at the erosion station near Statesville, N. C., show that only 0.001 ton an acre of soil and 0.06 percent of rainfall are lost from virgin woodland (3). A companion plot, burned twice yearly, showed runoff of 11.5 percent and soil loss of 3.08 tons an acre.

Similar experiments were made at Zanesville, Ohio, for a 9-year period on cultivated land, pasture, and woodland (2). Runoff was 20.6 percent on cultivated land, 13.8 percent on pasture, and 3.2 percent on woodland. The loss of soil an acre was 17.18 tons on cultivated land, 0.1 ton on pasture, and 0.01 ton on woodland.

These experiments show that erosion control and moisture absorption are maximum under complete forest cover. Soils forested with old-growth timber are more porous and absorb water much more rapidly than if they are cultivated. Where the forest cover is properly maintained, soils forested with second growth do not lose their

porosity unless they are overgrazed or the litter is destroyed by fire (1).

Prevention of fires, control of grazing, and use of good cutting practices are necessary for satisfactory forest production. In addition, they are needed for maintenance of the maximum soil porosity required for erosion control.

FIRE PREVENTION

A part of the forest in Decatur County is burned annually. Most of the fires result from carelessness in burning brush but a few are set by incendiaries. Fire control is needed not only for satisfactory forest production but also for maintenance of maximum soil porosity and control of erosion.

CONTROL OF GRAZING

Grazing seriously affects production of timber and encourages erosion. Experiments made in Indiana show that woodland grazing does not pay on certain soils in the State. Woodland grazing under intensities of 2, 4, or 6 acres per animal unit without supplementary feeding resulted in serious deterioration of the animals over a 6-month season (4). Timber-producing capacity is gradually destroyed by repeated browsing, and the natural regeneration of the stand is prevented. Compaction of the soil, disturbance of humus, and resulting interference with soil porosity lessen water absorption.

CUTTING PRACTICES

The cut-over woodland and forest in this county contains many culls that hinder development of trees of potential value as saw timber. Farm woodlands can be materially improved by cutting the crooked, short, bushy-top, unsound, or slow-growing trees for fuel or other farm needs or for sale as pulpwood or chemical wood. The straight, tall, well-crowned trees free of defect should be reserved for growth into saw timber.

PLANTING

Natural reforestation, more economical than planting, can be encouraged by selective cutting and by protecting areas from fire and overgrazing, but some areas, particularly of severely eroded Fourth- and Fifth-class soils, may have to be planted.

The first step in planting is that of making a preliminary examination to determine which pioneer species will grow best, considering the particular soil, the degree of erosion, exposure, and other local factors. Some general statements concerning suitabilities of different kinds of soil for different species may be of value.

Loblolly pine, and to lesser degree shortleaf pine, is usually best suited to the severe growing conditions encountered on most land in this county designated for forest. Loblolly pine must be depended on heavily for most of the eroded areas unless owners are willing to undertake the intensive preparation and fertilization of the land required to grow black locust (pl. 7, A). Loblolly pine seems to make more vigorous early growth than shortleaf pine on most of the soils and consequently tends to stabilize erosion more quickly. Pine can be expected to grow rapidly on Etowah and Dexter soils. The

exposed siltpan of the Dulac, Tippah, Paden, Freeland, and similar soils presents very difficult growing conditions, even for pine. In fact, the likelihood of success with loblolly pine or even shortleaf pine is greater on these soils if the seedlings are planted below rather than directly in the siltpan.

Thinnings from existing pine plantings will provide durable fence posts when cold-soaked in appropriate chemicals. Black locust is very poorly suited to all severely eroded areas, regardless of soil type, and rarely grows to post size on severely eroded soils of the Cuthbert, Luverne, Freeland, Paden, Dulac, and Tippah series. Locust does grow rapidly on moist well-aerated fill material on soils of the Ruston, Savannah, Bodine, Pickwick, Etowah, Dexter, and similar series. Yellow-poplar and sweetgum grow rapidly in the fill material washed from Ruston soils. On the eroded Talbott and stony land separations it is probably best to encourage natural seeding of redcedar by protecting the cedars with an introductory planting of locusts on parts of the area where fill material has accumulated (pl. 7, *B*).

As indicated in preceding discussion, each area to be planted presents specific problems. To insure success in planting, some advance preparation of the land is necessary. This includes breaking and mulching galled areas, building simple, low check dams in gullies, and plowing contour furrows. Preparation of severely gullied land entails much labor. In the past personnel from TVA-CCC camps have done much of the land preparation, but in areas where less advance preparation is necessary the landowner is now encouraged to do the entire job. Forest seedlings are furnished for planting without cost by the Tennessee Valley Authority.

MORPHOLOGY AND GENESIS OF SOILS

Soil is the product of soil-forming processes acting on materials deposited or accumulated by geologic agencies. The characteristics of the soil at any given point are determined by (1) the physical and mineralogical composition of the parent material, (2) the climate under which the soil material has accumulated and existed since accumulation, (3) the plant and animal life on and in 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 soil material (10).

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 a definite morphology. The effects of climate and vegetation on the parent material are guided, or limited, to varying degrees by the modifying influence of relief, which affects drainage, the quantity of water that percolates through the soil, the rate of natural erosion, the vegetation that grows on the soil, and other conditions.

The nature of parent material itself also guides the course of action that results from the forces of climate and vegetation. It is important in determining internal soil characteristics and the kinds of vegetation that grow on the soil.

Time, finally, is necessary for the changes to take place, and age becomes a factor of soil genesis. Time is required for the development of the soil 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 forces of climate and vegetation act, as that rate is guided by the factors of relief and parent material.

The factors of soil genesis are so closely interrelated in their effects on the soil that few generalizations can be made regarding the effects of any one unless conditions are specified for the other four. They are so complex in their interrelationships that many of the processes that take place in the development of soils are unknown.

The purpose of this section is to present the outstanding morphological characteristics of the soils of the county and to relate them to the factors of soil formation. Physical and chemical data are limited for these soils, and the discussion of soil genesis and morphology is correspondingly incomplete. The first part of the section deals with the environment under which the soils exist; the second, with specific soil series and the part environment has played in determining the morphologies of soils of those series.

GENERAL ENVIRONMENT AND MORPHOLOGY OF SOILS

The parent materials of soils of the county may 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. Materials of the first class are related directly to the underlying rocks from which they were derived; materials of the second class are related to the soils or rocks from which they were washed or fell.

The residual parent materials are residuum from the weathering of consolidated sedimentary rocks, limestones, and unconsolidated rocks, loess, and Coastal Plain sand and clay. The properties of those materials are strongly reflected in many of the properties of the soils that have developed from them. These rocks were laid down as unconsolidated sediments and some were gradually converted into consolidated rocks. Some of the rocks are so young, geologically, that they have not been consolidated.

Certain soils developed from residual materials are generally associated with particular rock formations or parts of rock formations. Soils of the Maury and Inman series are derived from the residuum of phosphatic limestone and shale of the Hermitage formation. The Talbott soils are associated with Dixon and Decatur limestones. Soils of the Bodine series are associated with the Harriman and Fort Payne chert formations. Soils of the Luverne, Cuthbert, Susquehanna, and Shubuta series are associated chiefly with the Eutaw formation. The Safford soils are derived from the glauconitic sandy clays of the Coon Creek member of the Ripley formation. The Ruston and Savannah soils are associated chiefly with the sand member of the Eutaw formation. The soils of the Dickson, Dulac, and Tippah series are derived from a thin layer of loess.

Among the transported rock materials, the kinds of material are reflected in some of the properties of the soils that are derived from them. Soils of the Dexter, Freeland, Hatchie, Almo, Tigrett, Briensburg, Alva, Eupora, Shannon, Hymon, and Beechy series are derived from transported materials that consist mainly of Coastal Plain sand

and clay and wind-blown silt, or products of their decomposition. Soils of the Pickwick, Paden, Taft, Robertsville, Wolftever, Huntington, Lindside, and Melvin series are derived from transported materials that are highly mixed but consist mainly of limestone and products of their decomposition. Soils of the Humphreys, Ennis, and Greendale series are composed of materials that are transported from cherty limestone materials. The soils of the Bruno and Sequatchie series are derived from transported materials consisting mainly of sandstone or Coastal Plain sand materials.

Although a relatively consistent relationship exists between the kinds of parent materials and some of the soil properties, other soil properties, especially those of regional significance from the standpoint of soil genesis, cannot be correlated with kinds of parent materials and must be attributed to other factors yet to be discussed.

The climate of the county is temperate and continental. It has long warm summers, short mild winters, and relatively high rainfall. The moderately high temperatures favor rapid chemical reactions in the soil under the moist conditions existing most of the time. The high rainfall favors relatively intense leaching of soluble materials and colloidal materials downward. The soil is frozen for only short periods and to only shallow depths during winter, which further intensifies weathering and translocation of materials.

The general climate of the county is relatively uniform, but small local differences in soils exist because of variations in the slope and exposure of land. On south- and west-facing slopes the average daily and annual temperature of the soil is somewhat higher than on the north- and east-facing slopes. Soil temperatures are also higher on the steeper slopes. Average moisture content of the soils is less on the south and west slopes than on the north and east slopes. These soil moisture and temperature conditions affect the length of time that the soil is frozen and the growth of vegetation on the soil. Although the differences are of small magnitude, they are significant and are possibly responsible for some of the local variations in soils derived from similar parent materials. Over the entire county, however, the differences in climate are not sufficient to account for broad differences that exist among the soils. It appears that the relatively uniform climate is responsible for some of the outstanding properties that many of the soils have in common, but because of its relative uniformity, climate cannot account for the broad differences that exist in the soils.

Trees, shrubs, grasses, and other herbaceous plants, micro-organisms, earthworms, and various other forms of plant and animal life live on and in the soil and are active agencies in the soil-forming processes. The nature of the changes these various biological forces bring about depends, among other things, on the kinds of life and the life processes peculiar to each. The kinds of plants and animals that live on and in the soil are determined by environmental factors, including climate, parent material, relief, age of the soil, and the associated organisms. The influence of climate is most apparent, though not always most important, in determining the kinds of microflora that grow on the well-drained, well-developed soils. In this way climate exerts a powerful indirect influence on the morphology of soils. Cli-

mate and vegetation acting together are the active factors of soil genesis.

A general oak-hickory forest association was on most of the well-drained, well-developed soils, although locally a large proportion of the forest stand may have been chestnut and yellow-poplar. There were probably differences in the density of stands, the relative proportion of species, and the associated ground cover. Taking the area as a whole, however, the forests appear to have been relatively uniform, and it is doubtful if any of the marked differences in properties among the well-drained, well-developed soils are the direct result of differences in vegetative cover.

Most of the trees that grow in this area are moderately deep to deep feeders on plant nutrients in the soil. They are chiefly deciduous trees and shed their leaves annually. The leaves range considerably among species in content of various plant nutrients, but in general, the quantities of bases and phosphorus returned to the soil in leaves of deciduous trees are high compared to quantities returned by coniferous trees. In this way, essential plant nutrients are returned to the upper part of the soil from the lower part and retard 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, where it is acted upon by micro-organisms, earthworms, and other forms of life and by direct chemical reaction. In Decatur County such materials decompose relatively rapidly because of favorable temperature and moisture conditions, favorable character of the organic material itself, and presumably favorable micropopulation in the soil. Organic material does not accumulate on well-drained sites in this area to the extent that it does in cooler regions under similar drainage conditions.

Little is known of the micro-organisms, earthworms, and other population of the soils of the area, but their importance is probably equal to that of the vegetation of the soil.

The well-drained, well-developed soils have been formed under relatively similar conditions of climate and vegetation. It is on these soils that climate and vegetation have had the maximum influence with the minimum of modifications by relief and age. As a result, the soils developed from various kinds of parent materials have many properties that are common to all.

In the virgin condition all the well-drained, well-developed soils have at the surface a layer of organic debris in varying stages of decomposition. All have dark-colored A₁ horizons, but their A₂ horizons are lighter than either the A₁ or B. The B horizon is generally uniformly colored yellow, brown, or red and is heavier textured than the A₁ or A₂. The C horizon is variable in color and texture among the different soils, but it is usually light red or yellow mottled with gray or brown.

The properties mentioned in the preceding paragraph are common to all well-developed, well-drained soils that have been subjected to similar conditions of climate and vegetation. They are therefore common to soils of zonal extent, and all soils that exhibit them are

known as zonal soils. Zonal soils are members of one of the classes of the highest category in soil classification and are defined as members of great groups of soils that have well-developed soil characteristics reflecting the influence of the active factors of soil genesis—climate and living organisms.

In localities where the parent materials have been in place a long time and have not been subject to extreme conditions of relief or of the parent material itself, the soils that have developed have the characteristics of zonal soils. In places where the parent material has been in place only a short time, as in the case of recently transported materials, the soils have poorly defined or no genetic horizons. These soils are young and have few or none of the properties of zonal soils; therefore, they are known as azonal soils, or soils belonging to a second class in the highest category of soils classification. Because of their youth or conditions of parent material or relief that prevent the development of normal soil profile characteristics, these soils are without well-developed profile characteristics.

Soils with the characteristics described in the previous paragraph are azonal. They have A_1 horizons that are moderately dark to very dark and apparently have a moderately to fairly high content of organic matter. They are characterized by the absence of a zone of illuviation, or B horizon, and by parent material that is usually of lighter color than the A_1 horizon and that may be similar to, lighter than, or heavier than the A_1 horizon in texture. They may be referred to as AC soils because of the absence of a B horizon.

The relief of the azonal soils ranges from nearly level to very steep. On some steep areas the quantity of water that percolates through the soils is relatively small and the quantity that runs off the soils is large. The rapid rate of runoff contributes to relatively rapid geologic erosion, and the soils are therefore young. That is, their materials are constantly renewed or mixed, and the changes brought about by vegetation and climate may be so slight that the soils are essentially AC soils. These are azonal soils.

On some nearly level areas where both internal and external drainage are restricted or where geologic erosion is very slow, soils whose materials have been in place a long time have certain well-developed profile characteristics that zonal soils do not have. Such soils are associated geographically with the zonal soils but are known as intrazonal soils. Intrazonal soils have more or less well-developed soil characteristics reflecting the dominating influence of some local factor of relief or parent material or age over the normal effects of climate and vegetation (10). The properties of such soils in this area are generally the result of level relief influenced greatly by the character of the parent material and the kinds of vegetation that grow in such environments.

Soils of each of the three broad classes—zonal, azonal, and intrazonal—may be derived from similar kinds of parent materials. Within any one of those classes in this area major differences among soils appear to be closely related to differences in the kinds of parent materials from which the soils were derived. The thickness of soils developed from residual materials over the rock from which they

were derived is a partial function of the resistance of the rock to weathering, the volume of residue after weathering, and the rate of geologic erosion. The chemical and physical nature of the parent material modifies the rate and direction of chemical changes that result from climate and vegetation. The kind of parent material also exerts a pronounced influence on the kinds of vegetation that grow on the soil. Rocks have also contributed to differences among soils through their effects on relief.

CLASSIFICATION OF SOILS

The soils of Decatur County are classified as shown in table 7. The relationships of geologic formations, topography, and soils in the county are shown in schematic cross section in figure 4. In the table the soils are listed according to order. The great soil groups under each order are shown, and the various soil series are listed under each great soil group. The source and kinds of parent materials and the relief of each soil are shown. Study of this table will aid the reader in understanding the genetic relationship of the soils of the county.

TABLE 7.—*Classification of the soil series of Decatur County, Tenn., into higher categories and some factors¹ that have contributed to the differences in soil morphology*

ZONAL SOILS

Great soil group and series	Relief	Parent material
Red-Yellow Podzolic soils:		
Red Podzolic soils:		Residuum from—
Ruston.....	Hilly to steep.....	Sandy Coastal Plain material.
Shubuta.....	Rolling.....	Sandy clay Coastal Plain material.
		Do.
Luverne.....	Rolling to hilly.....	Glauconitic sandy clay Coastal Plain material.
Safford.....	Hilly.....	Argillaceous limestone.
		Phosphatic limestone.
Talbott.....	Undulating to steep..	Mixed alluvium covered with a thin loesslike silt mantle.
Maury.....	Undulating to rolling..	Alluvium from—
Pickwick.....	Undulating to hilly..	A wide variety of rocks including limestone.
		Chiefly from sandstone.
Etowah.....	Hilly to steep.....	Loess and Coastal Plain materials.
Waynesboro.....	Rolling to hilly.....	
Dexter.....	Undulating to hilly..	
Yellow Podzolic soils:		
Humphreys.....	Nearly level to undulating.	Cherty limestone.
Sequatchie.....	do.....	Sandstone, sand, and some limestone.

¹ Inasmuch as the climate and vegetation are relatively uniform throughout the county, they cannot be factors accounting for the broad differences in the soils.

TABLE 7.—Classification of the soil series of Decatur County, Tenn., into higher categories and some factors¹ that have contributed to the differences in soil morphology—Continued

INTRAZONAL SOILS		
Great soil group and series	Relief	Parent material
Planosols:		
Dulac.....	Undulating to rolling.	Residuum from— Loess underlain by sandy clay Coastal Plain material at 24 to 42 inches.
Tippah.....	do.....	Loess underlain by clay Coastal Plain material at 24 to 42 inches.
Dickson.....	do.....	Loess or loesslike material underlain by cherty limestone at 24 to 42 inches.
Savannah.....	do.....	Very fine sandy Coastal Plain material with small admixture of loess.
Paden.....	do.....	Highly mixed alluvium covered with thin loesslike silt mantle.
Taft.....	Nearly level.....	Do.
Robertsville.....	Nearly level to depressional.	Do.
Freeland.....	Undulating to rolling.	Alluvium from— Loess and Coastal Plain materials.
Hatchie.....	Nearly level.....	Do.
Almo.....	Nearly level to depressional.	Do.
Wolftever.....	Nearly level.....	A wide variety of rocks, including limestone.
AZONAL SOILS		
Lithosols:		
Bodine.....	Rolling to steep.....	Residuum from— Cherty limestone.
Cuthbert.....	Hilly to steep.....	Sandy clay or clay Coastal Plain material.
Susquehanna.....	Rolling to hilly.....	Clay Coastal Plain material.
Inman.....	Hilly to steep.....	Interbedded shale and phosphatic limestone.
Alluvial soils:		
Huntington.....	Nearly level.....	Alluvium from— Chiefly limestone.
Lindside.....	do.....	Do.
Melvin.....	do.....	Do.
Egam.....	do.....	Do.
Bruno.....	do.....	Chiefly sand or sandstone, but including limestone materials.
Ennis.....	do.....	Chiefly cherty limestone.
Shannon.....	do.....	Loess and Coastal Plain materials.
Hymon.....	do.....	Do.
Beechy.....	do.....	Do.
Emory.....	Undulating.....	Colluvium or local alluvium from— Limestone.
Greendale.....	Nearly level to sloping	Cherty limestone.
Tigrett.....	Undulating.....	Loess.
Briensburg.....	do.....	Do.
Alva.....	do.....	Loess and Coastal Plain materials.
Eupora.....	do.....	Do.

ZONAL SOILS

RED-YELLOW PODZOLIC SOILS

The Red Podzolic soils are zonal soils of the Red-Yellow Podzolic great soil group having thin organic and organic-mineral layers over a yellowish-brown leached layer that rests upon an illuvial red horizon. They are developed under a deciduous or mixed forest in a warm-temperate moist climate (10). The soil-forming processes involved in their development are laterization and podzolization.

Soils of the Red Podzolic group in Decatur County are listed in table 7. These soils have the characteristics common to Red Podzolic soils and apparently all have developed under relatively similar climate and vegetation. They are well drained, and though they range somewhat in degree of maturity, they are sufficiently old to have at least a moderately well developed Red Podzolic soil profile. They range from level to steep, but differences among the soil profiles are probably not due primarily to differences in slope. Differences among the parent materials of the various soils are marked, and many differences among soil profiles can be correlated with differences among parent materials.

Ruston Series

The Ruston soils have developed from a loose sandy material on a hilly to steep relief. External and internal drainage are moderate to rapid. The soils are therefore highly leached, very strongly acid, and moderately low in fertility. Although on the whole their profiles are moderately well developed, development differs considerably as it has been impeded in places by the resistant character of the parent material and by steep slopes. The sand grains that make up a large part of the material are highly resistant to disintegration, and high water runoff on the steep slopes removed the finer particles rapidly. The water-holding capacity of the material is low; therefore, water for plant growth and energy for soil formation are low. Nevertheless, the Ruston soils have developed to the extent that they would ordinarily be included in the zonal group of Red Podzolic soils, though some profiles, especially on the extremely steep slopes, are azonal (Lithosols).

Typical profile for Ruston fine sandy loam soils:

- A₁ 0 to 2½ inches, dark-gray loose loamy fine sand containing some partly decayed leaves and twigs; numerous fibrous roots.
- A₂ 2½ to 10 inches, yellowish-gray loose fine sandy loam; a few roots; poorly developed fine crumb structure.
- A₃ 10 to 14 inches, light grayish-yellow loose fine sandy loam.
- B₁ 14 to 30 inches, reddish-brown very friable light fine sandy clay loam; roots of all sizes; weakly developed medium nut structure.
- C 30 to 40 inches, reddish-brown or brownish-red friable sand or light sandy clay; slightly brittle when dry.
- D 40 to 60 inches +, yellowish-brown loose sands with layers of gray sand.

Shubuta Series

The Shubuta are zonal Red Podzolic soils. They are highly podzolized and have well-defined A, B, and C horizons. They are well drained and are characterized morphologically by a loose grayish-yellow A horizon and a heavy plastic sticky yellowish-red B horizon. Both the underlying material and relief of these soils are distinctive.

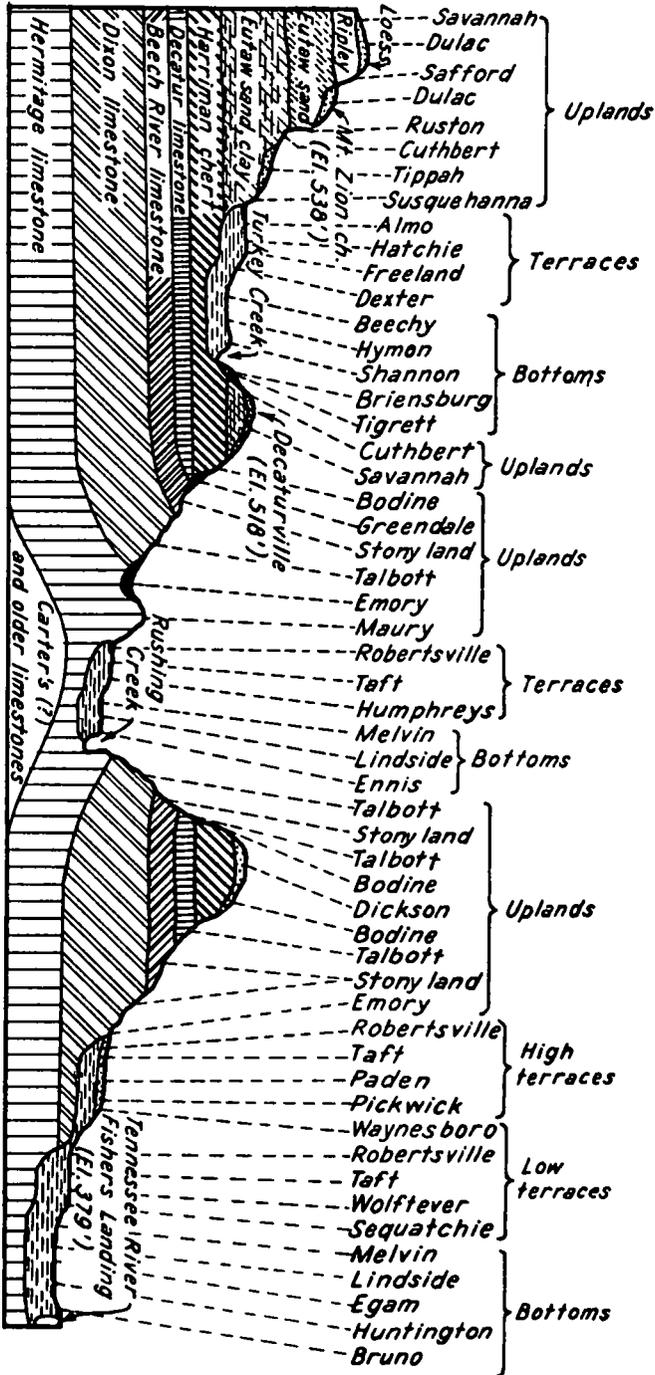


FIGURE 4.—Schematic cross section showing relationships of geologic formations, topography, and soils in Decatur County, Tenn.

The underlying material is an acid heavy sandy clay with conspicuous thin shale-like horizontal clay layers ranging from about $\frac{1}{16}$ to 1 inch thick. The Shubuta soils are on areas where the relief is mild, and it is significant that where the relief is steep Cuthbert soils have developed. It seems, therefore, that the particular combination of relief and parent material is chiefly responsible for development of Shubuta soils.

Representative profile for Shubuta fine sandy loam soils:

- A₁. 0 to 2 inches, gray loose fine sandy loam stained dark with organic matter and containing several ferruginous sandstone fragments; numerous small fibrous roots.
- A₂. 2 to 8 inches, grayish-yellow loose fine sandy loam containing several ferruginous sandstone fragments $\frac{1}{2}$ to 2 inches across; numerous small roots.
- A₃. 8 to 10 inches, grayish-yellow friable clay loam.
- B₁. 10 to 20 inches, yellowish-red plastic clay; well-defined angular nut (blocky) structure; particles about $\frac{1}{4}$ to $\frac{3}{4}$ inch in cross section; surface particles, yellowish red; crushed material, reddish yellow; a few large roots.
- B₂. 20 to 25 inches, reddish-yellow tough plastic and sticky clay, spotted with red and gray; structure less well defined than in the layer above; penetrated by very few roots.
- C. 25 to 36 inches, tough plastic and sticky clay highly mottled with red, yellow, and gray.
- D. 36 to 60 inches +, heavy sandy clay material highly mottled with red and yellow; thin layers of bluish-gray clay $\frac{1}{16}$ to 1 inch thick.

Luverne Series

Like the Shubuta soils, the Luverne soils are zonal and belong to the Red Podzolic group. They differ morphologically from the Shubuta soils chiefly in being redder in the B horizon. They also have a thicker solum and apparently have better internal drainage. They have developed under similar conditions of climate, vegetation, and relief, and both have parent materials derived from acid heavy sandy clay in which occur conspicuous thin shale-like horizontal layers of bluish-gray clay. The material under the Luverne soils, however, is a deep red or brownish red, somewhat more permeable and better drained, and much higher in iron content than that under the Shubuta soils. These differences in parent material are evidently largely responsible for differences in Luverne and Shubuta soils.

Representative profile for Luverne fine sandy loam soils:

- A₁. 0 to 2 inches, medium-gray loose fine sandy loam stained with organic matter.
- A₂. 2 to 8 inches, grayish-yellow loose fine sandy loam containing numerous small ferruginous sandstone fragments $\frac{1}{2}$ to 2 inches across.
- A₃. 8 to 10 inches, grayish-yellow friable clay loam.
- B₁. 10 to 25 inches, red or brownish-red strongly plastic clay; well defined medium angular nut (blocky) structure.
- B₂. 25 to 30 inches, red strongly plastic clay; structure of this layer less well defined than that of the layer above it.
- C. 30 to 44 inches, red strongly plastic clay streaked and spotted with yellow and gray.
- D. 44 inches +, red sandy clay with thin layers of bluish-gray clay $\frac{1}{16}$ to 1 inch thick.

Safford Series

The Safford soils, like the Ruston soils, have developed chiefly on a hilly relief. Unlike the Ruston soils they have developed from

a heavy sandy clay material similar in texture and consistence to the material from which the Shubuta soils have developed. This material differs from that for Shubuta soils in containing considerable quantities of green sand—a material high in potash and comparatively high in phosphate. The combination of slope and parent material is apparently responsible for formation of Safford soils and for differences between these soils and others developed from Coastal Plain materials. Safford soils have a characteristic white oak and beech forest vegetation, which is probably the result, not the cause, of differences between them and other soils. The Safford are Red Podzolic soils and belong in the zonal order.

Representative profile for Safford very fine sandy loam soils:

- A₁. 0 to 1 inch, dark-gray loose very fine sandy loam; a few small ferruginous sandstone fragments; numerous fibrous roots.
- A₂. 1 to 5 inches, yellowish-gray friable very fine sandy loam; several small roots.
- B₁. 5 to 8 inches, yellowish-brown friable clay loam.
- B₂. 8 to 20 inches, reddish-brown heavy clay or silty clay, hard when dry and strongly plastic when wet; strongly developed medium-sized angular nut (blocky) structure; some large roots.
- B₃. 20 to 30 inches reddish-brown to yellowish-red strongly plastic heavy sandy clay streaked and spotted with greenish gray; less well developed structure than the above layer; particles larger and less uniform in shape; very few roots.
- C. 30 to 45 inches, reddish-yellow sandy clay streaked and spotted with a greenish-gray sandy material.
- D. 45 to 60 inches +, gray sandy clay spotted with yellow; considerable quantities of green sand and mica.

Talbott Series

Soils of the Talbott series have heavy-textured B and C horizons, a property associated with the argillaceous limestone from which their parent materials are derived. They are relatively shallow over bedrock. Their position, relief, and thickness indicate that the limestone from which they are derived weathers rapidly and leaves a relatively small quantity of insoluble residue. The fact that they erode readily when cultivated, and may have eroded relatively rapidly under natural vegetation, probably accounts in part for their shallow depth over bedrock. Like the other zonal soils of the area, they have developed under a deciduous forest vegetation in a warm-temperate moist climate. In many places the forest cover contains many cedars, but these trees have not significantly influenced the morphology of the soil.

Representative profile for Talbott silt loam soils:

- A₁. 0 to 2 inches, dark grayish-brown friable silt loam stained dark with organic matter.
- A₂. 2 to 6 inches, grayish-brown friable heavy silt loam; fine crumb structure.
- B₁. 6 to 8 inches, yellowish-brown friable silty clay loam with a moderately well developed fine nut structure.
- B₂. 8 to 24 inches, yellowish-red tough plastic and sticky silty clay, hard and intractable when dry; well-developed medium nut structure.
- B₃. 24 to 30 inches, reddish-yellow silty clay with an angular nut structure; material spotted with red, yellow, and brown; less compact in place than the B₂ layer and the aggregates more easily crushed into a coarse crumbly mass.
- C. 30 to 40 inches, very strongly plastic heavy silty clay highly mottled with red, yellow, and gray; underlain by consolidated slightly argillaceous limestone.

Maury Series

Soils of the Maury series have developed from materials residual from the weathering of phosphatic limestone. In this county the parent material in many places contains a small admixture of loess, and as a result the upper part of the profile is lighter textured and more friable than in other areas. The Maury soils are medium acid and high in plant nutrients, especially phosphorus. Since they are the most productive of the well-developed soils in the county, it is reasonable to expect that they supported the most luxuriant vegetation and that the natural result would be a dark-colored A horizon. The heavy vegetative growth and the high organic-matter content in the soil would tend to inhibit erosion and result in a more friable surface soil and subsoil and a thicker solum. In many places the underlying phosphatic limestone is interbedded with shale. It is significant that on the steep slopes Inman soils have developed from the residuum of these interbedded rocks. The combination of a mild relief and highly phosphatic parent material seems to be responsible for the differences between Maury and the Inman soils on one hand and the Talbott soils on the other.

Representative profile for Maury silt loam soils:

- A₁. 0 to 3 inches, dark grayish-brown mellow silt loam stained dark with organic matter.
- A₂. 3 to 8 inches, brown friable silt loam; fine crumb structure.
- A₃. 8 to 12 inches, light-brown to yellowish-brown heavy silt loam.
- B₁. 12 to 30 inches, reddish-brown moderately plastic heavy silty clay loam; medium subangular nut structure; a few small black concretions.
- B₂. 30 to 35 inches, light-brown strongly plastic silty clay; more numerous concretions than in the layer above; less distinct structure.
- C. 35 to 70 inches, yellowish-brown strongly plastic silty clay spotted with yellow and gray; numerous small partly weathered limestone fragments; small black concretions in the lower part of the horizon; underlain by thin-bedded phosphatic limestone.

Pickwick Series

The soils of the Pickwick series are on high stream terraces. The old alluvium of these terraces has apparently been covered to a depth of about 30 inches with loess. The parent material from which the soils are formed consists of loess or various mixtures of loess and alluvium. The alluvium is highly mixed and has washed from upland soils underlain by a wide variety of rocks, including limestone, shale, sandstone, and Coastal Plain sand and clay. The parent material is similar to that of the Paden soils, but it is on stronger slopes and is underlain by more permeable material. The differences in the permeability of the underlying material are thought to be largely responsible for the development of the different soils.

Representative profile for Pickwick silt loam soils:

- A₁. 0 to 2 inches, dark grayish-brown mellow silt loam stained dark with organic matter.
- A₂. 2 to 10 inches, grayish-brown mellow silt loam; weak fine crumb structure.
- B₁. 10 to 14 inches, light-brown or yellowish-brown friable heavy silt loam.
- B₂. 14 to 30 inches, light reddish-brown friable silty clay loam; moderately well developed medium subangular nut structure.
- B₃. 30 to 40 inches, reddish-brown friable silty clay loam to clay loam lightly spotted with gray and yellow; some sand and gravel.

- C. 40 inches +, reddish-brown or brownish-red moderately plastic silty clay loam to clay loam spotted with yellow and gray; a considerable quantity of gravel.

Etowah Series

The soils of the Etowah series are on high terraces associated with the soils of the Pickwick series. Their parent material—old alluvium with very little or no loess influence—has washed from soils underlain by a mixture of material from limestone, shale, sandstone, and Coastal Plain sand and clay. It is characterized by a high gravel content in this county. Since loess covers most of the areas with smooth surfaces, the Etowah soils are on slopes in the more highly dissected areas. They have relatively open substrata that favor rapid leaching but their relatively high fertility appears to have encouraged a heavy forest growth that resulted in the relatively high content of organic matter in the upper layers.

Representative profile for Etowah gravelly silt loam soils:

- A₁. 0 to 2 inches, dark grayish-brown loose gravelly silt loam stained dark with organic matter.
- A₂. 2 to 8 inches, grayish-brown gravelly silt loam.
- B₂. 8 to 30 inches, reddish-brown friable gravelly silty clay loam.
- C. 30 inches +, reddish-brown very gravelly silt loam to silty clay loam.

Waynesboro Series

The Waynesboro soil has developed on extremely high terraces from highly mixed alluvium. The parent material is similar to that of the Etowah soils but is predominantly sandy and also much older. The soil is highly leached, moderately low in organic matter and plant nutrients, and strongly to very strongly acid.

Representative profile of Waynesboro fine sandy loam:

- A₁. 0 to 1 inch, medium-gray loose fine sandy loam.
- A₂. 1 to 8 inches, yellowish-gray loose fine sandy loam.
- A₃. 8 to 12 inches, reddish-yellow friable heavy fine sandy loam.
- B₂. 12 to 30 inches, light reddish-brown friable fine sandy clay loam with a weakly developed medium nut structure.
- B₃. 30 to 40 inches, light-red friable light sandy clay loam; less structure than the layer above.
- C. 40 inches +, light-red light sandy clay loam streaked and spotted with yellow and gray; considerable small gravel.

Dexter Series

The soils of the Dexter series are on high terraces. Their parent materials are mixed alluvium washed from soils of the uplands underlain by loess and Coastal Plain sand and clay, or in many places a thin layer of loess underlain by the mixed alluvium. Internal and external drainage are moderate. The soils have developed under deciduous forest. The parent materials are similar to those of the Freeland soils, and differences in the permeability of the underlying materials are probably largely responsible for development of the different soil series.

Representative profile for Dexter silt loam soils:

- A₁. 0 to 2 inches, dark grayish-brown mellow silt loam stained dark with organic matter.
- A₂. 2 to 7 inches, grayish-brown mellow silt loam; weak soft crumb structure.
- A₃. 7 to 10 inches, light-brown very friable silt loam.

- B₁. 10 to 13 inches, yellowish-brown friable heavy silt loam ; moderately well developed subangular nut structure ; material crushes to a smooth yellowish-brown mass.
- B₂. 13 to 26 inches, reddish-brown to brownish-red friable silty clay loam ; moderately well developed subangular nut structure.
- B₃. 26 to 38 inches, brown to reddish-brown friable silty clay loam or clay loam ; less friable and heavier textured than layer above ; structure less well developed and more irregular in shape ; crushed material is brownish yellow.
- C. 38 to 60 inches, yellowish-brown friable clay loam or fine sandy clay loam spotted with gray.

Yellow Podzolic soils are zonal soils of the Red-Yellow Podzolic great soil group having thin organic and organic-mineral layers over a grayish-yellow leached layer that rests on a yellow horizon (10). The Yellow Podzolic soils of Decatur County have an undulating relief and were developed under a forest vegetation consisting mainly of deciduous trees. There may have been a somewhat less luxuriant and different kind of undergrowth on the Yellow Podzolic soils than on the Red Podzolic soils of the county, although the degree of uniformity of such a relationship is unknown. Climatic conditions on the soils of the two groups were apparently fairly similar. The parent materials were derived from terrace materials.

The causes for development of the pronounced color differences between the Yellow Podzolic and the Red Podzolic soils are not known. It appears, however, that the Yellow Podzolic soils of the area are generally associated with parent materials younger, lower in bases, or less well drained internally than parent materials of the Red Podzolic soils.

Humphreys Series

The Humphreys soils are on low terraces along the streams in the cherty Limestone Hills section. They have developed on nearly level areas under a deciduous forest. Their parent material consists of general stream alluvium, nearly all of which has been washed from cherty soils that have some loess materials in places. In many places Humphreys soils are subject to infrequent overflow and thus receive some additional sediments. They are well drained relatively young soils that show but little profile development. In most places, however, the profile is sufficiently well developed for the soil to be included with the Yellow Podzolic soils.

Representative profile of Humphreys silt loam :

- A₁. 0 to 2 inches, grayish-brown mellow silt loam stained dark with organic matter.
- A₂. 2 to 7 inches, grayish-brown to light-brown mellow silt loam with a poorly developed soft crumb structure.
- A₃. 7 to 9 inches, light-brown friable silt loam ; weak crumb structure.
- B₁. 9 to 12 inches, yellowish-brown friable heavy silt loam.
- B₂. 12 to 23 inches, brown or yellowish-brown friable heavy silt loam or silty clay loam ; very weak small subangular nut structure.
- B₃. 23 to 30 inches, brownish-yellow friable silt loam ; very weakly developed subangular nut structure.
- C. 30 inches +, yellow friable silt loam to gravelly silt loam spotted with gray and bright yellow ; beds of water-worn chert in most places at depths varying from 30 to about 60 inches.

Sequatchie Series

The Sequatchie soil in the county is on low terraces of the Tennessee River. It has developed under conditions of moderately slow external

drainage and moderate internal drainage from general stream alluvium in which sandy materials predominate. It was developed under a hardwood forest and under climatic conditions similar to those of other zonal soils of the county. Some of the materials from which the soil is derived, however, were so recently deposited that only weak profile development is apparent. In most places, nevertheless, the profile is that of a Yellow Podzolic soil.

Representative profile of Sequatchie fine sandy loam :

- A. 0 to 3 inches, grayish-brown loose fine sandy loam stained dark with organic matter.
- A₁. 3 to 10 inches, light-brown to grayish-brown loose fine sandy loam containing a moderate quantity of organic matter.
- B₁. 10 to 30 inches, brown or yellowish-brown friable fine sandy clay loam that grades into brownish yellow in lower part of horizon; in most places, a weakly developed nut structure.
- C. 30 inches +, brownish-yellow friable clay loam lightly splotched with gray and yellow.

INTRAZONAL SOILS

PLANOSOLS

Planosols are an intrazonal group of soils with eluviated surface horizons underlain by B horizons more strongly illuviated, cemented, or compacted than in associated normal soils. They have developed upon nearly flat upland surface under grass or forest vegetation in a humid or sub-humid climate (10).

In Decatur County most of the soils classed as Planosols are characterized by a siltpan at a depth of about 2 feet. The drainage of these soils varies from moderately well drained to poorly drained, and some of the more poorly drained soils have claypans rather than siltpans. The siltpan is not a zone of high clay concentration. In fact the clay content appears to be relatively low. The material is compact rather than cemented, although it may have some silica cementation.

The climatic conditions under which these soils developed were similar to those under which the zonal soils developed, but the internal condition of the soil is more moist and less well aerated than is that of the zonal soils. Some differences probably existed in kinds of vegetation, although deciduous forest was on both. From the standpoint of profile development, the Planosols appear to be older than the Red or Yellow Podzolic soils, but the causes for the development of older soils are not known. The relief is such that geological erosion would be slow, but that factor alone is not the cause of their formation. It has been observed that the siltpan soils in the county are formed from parent materials very high in silt and very fine sand and low in clay and coarse sand. Also, they are underlain by materials that restrict internal drainage. In general, the thicker and more compact siltpans are associated with the less permeable underlying materials and with the areas with the least sloping surface.

Dulac Series

The Dulac soils have developed from a 24- to 42-inch layer of loess underlain by semipervious Coastal Plain material. This underlying material may consist of heavy sandy clay, alternate layers of sand and clay, or sand that has a horizontal layer of ferruginous sandstone near the contact of the silt and sand.

Representative profile for Dulac silt loam soils:

- A₀. ½ to 0 inch, partly decomposed leaves, bark, and twigs.
- A₁. 0 to 2 inches, gray mellow silt loam stained dark with organic matter; numerous fibrous roots.
- A₂. 2 to 7 inches, yellowish-gray mellow silt loam; numerous roots of all sizes.
- A₃. 7 to 9 inches, grayish-yellow friable heavy silt loam.
- B₁. 9 to 20 inches, yellowish-brown friable silty clay loam that changes gradually to brownish-yellow in the lower part of the horizon; material breaks out into fine to medium weak subangular nut structure; particles yellowish-brown but crush to a smooth yellow mass; some large roots penetrate layer.
- B₂. 20 to 24 inches, brownish-yellow friable silty clay loam lightly splotched with yellow and gray.
- X. 24 to 42 inches, very compact silty clay loam highly mottled with gray, yellow, and brown; material in this layer breaks into coarse fairly well-developed structural particles irregularly blocky to prismatic in shape; some small concretions; many vertical cracks, ¼ to 1 inch in width, filled with a light-gray silty material; very few roots penetrate layer.
- D. 42 to 60 inches +, slowly permeable heavy sandy clay highly mottled with red, yellow, brown, and gray.

Tippah Series

The Tippah soils have developed from a thin layer of loess overlying Coastal Plain material. They differ from the Dulac soils in being underlain by heavy acid clays that are relatively impervious to water. In general, the layer of silt is not so thick as that from which the Dulac soils have developed. The imperviousness of the underlying material has apparently resulted in more rapid runoff and more geological erosion. The A and B horizons are similar to those of the Dulac soils, but the siltpan is not on the average so thick and is somewhat heavier textured owing to mixing of the silt with the underlying clay.

Representative profile for Tippah silt loam soils:

- A₁. 0 to 1½ inches, dark-gray mellow silt loam stained dark with organic matter; numerous small fibrous roots.
- A₂. 1½ to 7 inches, grayish-yellow mellow silt loam; some roots of different sizes.
- B₁. 7 to 10 inches, brownish-yellow friable light silty clay loam.
- B₂. 10 to 18 inches, yellowish-brown to brownish-yellow friable silty clay loam; small to medium weakly defined subangular nut structure; yellowish brown particles crush to a smooth yellow mass.
- B₃. 18 to 22 inches, brownish-yellow friable silty clay loam lightly splotched with gray; texture somewhat heavier and the structure more distinct than in layer above.
- X. 22 to 38 inches, very compact heavy silty clay loam mottled with gray, yellow, and brown; fairly well defined coarse angular blocky structure.
- D. 38 to 60 inches +, tough plastic and sticky clay highly mottled with gray, yellow, and red; material grades into bluish-gray clay.

Dickson Series

In Decatur County a large part of the parent material from which the Dickson soils have developed came from loess, though a part of their loesslike silt probably is derived through weathering of the underlying cherty limestone. In the counties farther east, however, Dickson soils have evidently developed from parent material weathered mostly from underlying cherty limestone. These soils

differ from the Dulac soils chiefly in having highly siliceous cherty limestone residuum underneath the siltpan.

Representative profile for Dickson silt loam soils:

- A₁. 0 to 1 inch, medium-gray mellow silt loam stained dark with organic matter; numerous fibrous roots.
- A₂. 1 to 6 inches, yellowish-gray mellow silt loam; some small roots.
- A₃. 6 to 8 inches, grayish-yellow friable heavy silt loam.
- B₂. 8 to 20 inches, yellowish-brown friable silty clay loam that changes gradually to a brownish yellow in lower part of the horizon; poorly defined medium subangular nut structure; some large roots.
- B₃. 20 to 24 inches, yellow friable silty clay loam lightly spotted with gray.
- X. 24 to 40 inches, compact silt loam to silty clay loam mottled with gray, yellow, and brown; compact in place but when displaced crumbles readily into fairly well defined structural particles very irregular in shape and $\frac{1}{2}$ to $1\frac{1}{4}$ inches in cross section.
- C. 40 to 60 inches +, very cherty silty clay loam mottled with gray and yellow.

Savannah Series

The Savannah soils, unlike other soils developed from unconsolidated sands and clays in Decatur County, have developed on undulating to rolling topography. They differ from these other soils in having a yellow B horizon and a compact layer just below the B horizon. The parent materials are derived from unconsolidated Coastal Plain materials that probably contain a small mixture of loess. Like the parent material of the Dulac soils, this material is high in very fine sand and silt and low in coarse sand. Savannah soils are generally considered as Planosols.

Representative profile for Savannah loam soils:

- A₁. 0 to 1 inch, gray loose loam stained dark with organic matter; numerous small fibrous roots.
- A₂. 1 to 8 inches, grayish-yellow loose loam; several small roots.
- B₂. 8 to 18 inches, yellowish-brown friable light clay loam or silty clay loam; weakly-developed fine subangular nut structure; some large roots.
- B₃. 18 to 25 inches, brownish-yellow friable clay loam lightly spotted with gray in the lower part of horizon.
- X. 25 to 40 inches, compact brownish-yellow fine sandy loam to fine sandy clay loam spotted with gray, yellow, and brown; compact in place, but displaced lumps are brittle and break easily; material breaks into coarse irregularly shaped weakly defined particles; very few roots.
- C. 40 to 60 inches +, reddish-brown fine sandy clay spotted with gray and yellow.

Paden Series

The Paden are moderately well drained soils of the high terraces characterized by a siltpan at a depth of about 2 feet. They belong to the Planosol group of intrazonal soils. In most places they have apparently developed from a thin layer of loess underlain by highly mixed old alluvium. In some places they may have developed from old Tennessee River alluvium that includes materials from soils underlain by limestone, shale, sandstone, Coastal Plain sand, clay, and loess. This material is high in silt and very fine sand and low in coarse and medium sands.

Profile description for Paden silt loam soils:

- A₁. 0 to 1 inch, medium-gray mellow silt loam stained with organic matter.
- A₂. 1 to 8 inches, grayish-yellow mellow silt loam.
- B₂. 8 to 10 inches, brownish-yellow friable heavy silt loam.

- B₁. 10 to 20 inches, yellowish-brown friable silty clay loam; fine or medium weak subangular nut structure.
- B₂. 20 to 24 inches, brownish-yellow friable silty clay loam lightly spotted with yellow and gray.
- X. 24 to 42 inches, brownish-yellow compact silt loam to silty clay loam spotted with yellow and gray; coarse moderately well developed irregularly shaped structure; many particles coated with gray silty material.
- C. 42 to 60 inches +, brittle silty clay loam highly mottled with red, brown, yellow, and gray.

Taft Series

The soil of the Taft series is intermediate between the Paden and Robertsville soils in drainage. It is similar to the Hatchie soils in drainage and many profile characteristics. It is on nearly level to gently sloping Tennessee River terraces.

The Taft soil is underlain by old stream alluvium washed chiefly from soils underlain by limestone materials. On the high terraces this alluvium is probably covered by a thin layer of loess in many places. The soil is associated with Paden soils on high terraces and with Wolftever or Humphreys soils on low terraces. It is on nearly level areas, and drainage, both external and internal, is slow.

Representative profile of Taft silt loam:

- A₁. 0 to 2 inches, dark-gray mellow silt loam stained with organic matter.
- A₂. 2 to 8 inches, yellowish-gray mellow silt loam; a few soft brown concretions.
- B₁. 8 to 15 inches, pale-yellow friable silty clay loam lightly spotted with gray in lower part of horizon.
- B₂. 15 to 22 inches, friable silty clay loam highly mottled with gray, yellow, and brown; large soft brown concretions.
- X. 24 to 44 inches, very compact soil loam to silty clay loam; breaks into coarse irregularly shaped particles coated with bluish-gray material; crushed particles highly mottled with gray, yellow, and brown.
- C. 44 to 60 inches +, yellowish-brown brittle heavy silty clay loam spotted with yellow and gray.

Robertsville Series

The Robertsville soil is similar to the Almo soil; it has developed on terraces, is poorly drained and light colored, and has a compact layer below the subsoil. It has developed from old alluvium similar to that giving rise to the Taft and Wolftever soils. It is on nearly level or depressed positions on low terraces. Both internal and external drainage are very slow. It appears that the poorer drainage, which results in differences in internal conditions, is chiefly responsible for the differences between this soil and that of the Taft series.

A typical profile of Robertsville silt loam is as follows:

- A₁. 0 to 2 inches, dark-gray mellow silt loam spotted with rust brown and stained with organic matter; numerous large ($\frac{1}{8}$ to $\frac{1}{2}$ inch) brown concretions.
- A₂. 2 to 8 inches, mellow silt loam mottled with dark gray and rust brown; numerous large soft brown concretions.
- B₁. 8 to 20 inches, friable silty clay loam highly mottled with light gray and pale yellow; material becomes predominantly light gray in lower part of horizon.
- X. 20 to 44 inches, bluish-gray very compact silt loam to heavy silty clay loam; numerous large soft brown concretions.
- C. 44 to 60 inches +, yellowish-brown brittle heavy silty clay loam spotted with yellow and gray.

Freeland Series

The Freeland soils are characterized by a siltpan and apparently belong to the Planosol group of intrazonal soils. Morphologically, they are similar to the Dulac soils of the upland and to the Paden soils on the high terraces of the Tennessee River. They have developed from old mixed alluvium washed from soils of the uplands underlain by loess and Coastal Plain materials. It is possible that on some of the older terraces a thin layer of loess has been deposited over the alluvium. The soils have developed from materials very high in silt on undulating to rolling topography under conditions of moderately slow internal drainage. The parent material is similar to that of the Dexter soils, and the restricted internal drainage is apparently responsible for the differences between these soils and those of the Dexter series.

Representative profile for Freeland silt loam soils:

- A₁. 0 to 1 inch, medium-gray mellow silt loam stained dark with organic matter.
- A₂. 1 to 6 inches, yellowish-gray mellow silt loam.
- A₃. 6 to 9 inches, grayish-yellow friable heavy silt loam.
- B₁. 9 to 18 inches, yellowish-brown friable silty clay loam of fine weak subangular nut structure.
- B₂. 18 to 24 inches, brownish-yellow friable silty clay loam.
- X. 24 to 42 inches, brownish-yellow compact silt loam to silty clay loam spotted with gray and yellow; material compact in place but brittle and easily broken when displaced; layer has a medium-sized, weakly developed, irregularly shaped structure.
- C. 42 to 60 inches +, reddish-brown brittle sandy clay loam spotted with yellow; some small pebbles.

Hatchie Series

The soils of the Hatchie series are on nearly level stream terraces in association with Freeland soils but differ from Freeland soils in being imperfectly drained. External and internal drainage are slow. They have developed from old alluvium similar to that from which the Freeland soils are derived. Like these soils they are silty in texture, acid, and have a siltpan at a depth of about 2 feet. The more poorly drained condition is apparently responsible for the differences between these and the Freeland soils. Hatchie soils belong to the Planosol group of intrazonal soils.

Representative profile of Hatchie silt loam:

- A₁. 0 to 2 inches, dark-gray mellow silt loam stained dark with organic matter.
- A₂. 2 to 7 inches, gray to yellowish-gray mellow silt loam that contains small brown concretions.
- A₃. 7 to 10 inches, yellowish-gray friable silt loam.
- B₁. 10 to 18 inches, pale-yellow friable silty clay loam spotted with gray and bright yellow in the lower part of horizon; poorly developed small nut structure; a few small brown concretions.
- B₂. 18 to 22 inches, friable silty clay loam highly mottled with yellow and gray; numerous brown concretions.
- X. 22 to 44 inches, very compact silt loam to silty clay loam highly mottled with yellow, gray, and rust brown; material breaks out into coarse irregularly shaped particles coated with bluish gray; numerous concretions.
- C. 44 to 60 inches +, pale-yellow brittle silty clay loam spotted with gray and rust brown and streaked with bluish gray.

Almo Series

The Almo soil has developed from the same general type of alluvium as the Freeland and Hatchie soils with which it is associated. It differs from the Hatchie soils chiefly in being poorly drained; it is similarly highly leached, acid, and low in organic matter and similarly manifests the development of siltpan. Consequently, it is included in the Planosol group of intrazonal soils.

Representative profile of Almo silt loam:

- A₁. 0 to 2 inches, medium-gray mellow silt loam spotted with light gray.
- A₂. 2 to 8 inches, gray mellow silt loam spotted with light gray and rust brown; a few small brown concretions.
- B₁. 8 to 10 inches, grayish-yellow friable heavy silt loam spotted with gray and yellow.
- B₂. 10 to 22 inches, gray or mottled yellow and gray friable silty clay loam; several concretions.
- X. 22 to 44 inches, very compact silty clay loam highly mottled with gray, yellow, and brown; bluish-gray coating on structural particles; numerous concretions.
- D. 44 to 60 inches +, moderately friable silty clay loam mottled with yellow and gray.

Wolftever Series

The Wolftever soils are characterized by a moderately compact to compact subsoil. They are on nearly level low young terraces of the Tennessee River. The soils are moderately well drained; both internal and external drainage are moderately slow. The general alluvium from which the Wolftever soils have developed has washed chiefly from upland soils underlain by limestone, but it includes some material from soils underlain by a wide variety of rocks. Although high in silt, this material has a higher clay content than the parent materials of most of the Planosols. The Wolftever soils are on young terraces and are therefore young in terms of years. In consequence, their profiles are not likely to be entirely a result of soil-forming processes; they may be partly the result of deposition of very fine material on what are now the substratum and subsoil layers.

Representative profile for Wolftever silt loam soils:

- A₁. 0 to 2 inches, grayish-brown mellow silt loam stained slightly with organic matter.
- A₂. 2 to 6 inches, light grayish-brown friable silt loam.
- A₃. 6 to 9 inches, light-brown friable heavy silt loam.
- B₂. 9 to 27 inches, yellowish-brown slightly to moderately compact heavy silty clay loam; moderately well developed small subangular nut structure.
- B₃. 27 to 40 inches, moderately compact silty clay loam lightly spotted with gray; well-developed coarse angular nut structure.
- C. 40 to 60 inches +, brownish-yellow brittle silty clay loam spotted with gray and yellow.

AZONAL SOILS

LITHOSOLS

Lithosols are an azonal group of soils that have no clearly expressed soil morphology. They consist of a freshly and imperfectly weathered mass of rock fragments and are largely steeply sloping (10). They occupy positions where geologic erosion is relatively rapid and generally consist of materials relatively easily eroded. As a result,

material is removed from the surface or mixed to such an extent that soil-forming processes have not acted on the soil material long enough to produce well-defined genetic soil properties. As mapped, these soils may include small areas of zonal soils.

The land types mapped in this county are Lithosols. The rough gullied lands have lost their true soil in most areas through accelerated erosion induced by man's activities. Other land types in the county are Hilly stony land (Talbot and Colbert soil materials) and Rolling stony land (Talbot and Colbert soil materials).

Bodine Series

Members of the Bodine series are chiefly on hilly to steep slopes in the highly dissected parts of the Limestone Hills section. The Bodine soils have developed from material that is residual from the weathering of highly cherty level-bedded Mississippian and Devonian limestones, and the soils are everywhere characterized by a high content of chert fragments.

The Bodine soils are highly leached, strongly to very strongly acid, and low in fertility. They generally do not have developed soil profiles, but they vary considerably in this respect. In some places, especially on lower parts of long slopes, chert fragments and soil materials have sloughed down from above to form a considerably deeper soil than typical. Slopes range from about 5 to 60 percent but in most areas are between 20 and 40 percent. Internal and external drainage are rapid to very rapid. The development of profiles has been considerably retarded by the highly resistant parent material and steep slopes.

The chert fragments that make up a great part of the material are highly resistant to disintegration and become available for soil formation at an exceedingly slow rate. Also, the strong relief and consequent rapid runoff leave little water for plant growth. The energy for soil formation is low, and further, the soil material tends to be removed relatively rapidly. Actually, parent material does not become available fast enough nor remain in place long enough for the dynamic soil-forming agencies, climate and vegetation, to form well-developed genetic soil profiles. The profiles of the Bodine soils have not developed to such extent that they can be included in the zonal group of Yellow Podzolic soils. Instead they are included with the Lithosols in the azonal order.

Representative profile for Bodine cherty silt loam soils:

- A. 0 to 2 inches, dark-gray loose cherty silt loam stained dark with organic matter; a few small roots.
- A. 2 to 7 inches, yellowish-gray or brownish-gray cherty silt loam; numerous roots.
- A. 7 to 18 inches, brownish-yellow friable cherty heavy silt loam.
- C. 18 to 60 inches +, yellow or brownish-yellow cherty silt loam or light silty clay loam lightly splotted with gray that grades into partly weathered beds of angular chert; cherty limestone bedrock at depths of 10 to 30 feet.

Cuthbert Series

The Cuthbert soils developed on hilly and steep slopes from residuum of heavy acid clay that is characterized by thin shale-like layers of bluish-gray clay in most places. They developed under a climate

similar to that of the zonal soils of the county, but the influence of climate was probably somewhat modified by the steeper slopes and the greater loss of moisture through runoff. For the same reason, temperatures in the soil may have been slightly different.

The Cuthbert soils are shallow and do not have well-developed profiles. The parent materials are very similar to those of the Red Podzolic Shubuta soils, but are on steep slopes, and being erosive, are removed by geologic erosion nearly as rapidly as they are formed. A normal zonal soil profile could not form under such conditions, so the Cuthbert soils are essentially AC soils.

Representative profile for Cuthbert fine sandy loam soils:

- A₁. 0 to 2 inches, gray loose fine sandy loam stained dark with organic matter; some ferruginous sandstone fragments.
- A₂. 2 to 10 inches, gray to grayish-yellow loose fine sandy loam; a few ferruginous sandstone fragments.
- A₃. 10 to 14 inches, grayish-yellow friable clay loam.
- C. 14 to 25 inches, predominantly reddish-yellow strongly plastic clay highly mottled with red, yellow, and gray; layer varies considerably in thickness, color, texture, and degree of mottling.
- D. 25 inches +, heavy sandy clay highly mottled with red and yellow; contains thin horizontal layers of bluish-gray clay.

Susquehanna Series

The soil of the Susquehanna series has developed from very strongly acid heavy Coastal Plain clay. It has rolling to hilly slopes and developed under deciduous forest vegetation consisting chiefly of black-jack and post oaks. General conditions are essentially the same as those under which the zonal soils developed, but the internal soil characteristics are probably different because the heavy soil material impedes movement of air, and moisture. The shallow profile probably results from the resistance of the clay to weathering and soil-forming processes. The parent materials are very heavy tenacious clays that prevent normal circulation of soil moisture and air and probably impede the activities of the soil micro-organisms. As a result, leaching, translocation of soil materials, oxidation, and other chemical reactions do not proceed as in a normal soil, and no true soil profile can be developed. This soil is associated with the Cuthbert soils and differs chiefly in being heavier textured, more strongly plastic, and shallower over unweathered clay.

Representative profile of Susquehanna very fine sandy loam:

- A₁. 0 to 1 inch, medium-gray loose very fine sandy loam stained with organic matter.
- A₂. 1 to 6 inches, grayish-yellow friable very fine sandy loam.
- C. 6 to 24 inches, reddish-yellow to yellow very strongly plastic heavy clay spotted with gray and yellow; material contains particles of unweathered clay and is highly mottled with red, yellow, and gray in the lower part of the horizon.
- D. 24 inches +, gray or bluish-gray heavy clay.

Inman Series

The soils of the Inman series have developed from the residuum of interbedded phosphatic limestone and shale. The limestone and shale are thin-bedded, and the alternate layers are exposed on the steep slopes. The residuum is highly mixed, but the proportion of material from each source varies greatly within short distances. The

Inman soils are on hilly or steep areas where geological erosion has removed the soil material almost as fast as it has formed. It is apparent that some of the Inman soils have formed from material that on areas of mild relief would give rise to Maury soils. The combination of mixed phosphatic limestone and shale residuum and steep slopes is considered responsible for development of Inman soils.

Representative profile for Inman silt loam, hilly phase.

- A₁. 0 to 2 inches, grayish-brown friable silt loam stained dark with organic matter.
- A₂. 2 to 8 inches, grayish-brown friable heavy silt loam with a moderately well developed fine crumb structure.
- A₃. 8 to 12 inches, brown friable heavy silt loam or silty clay loam having a weak small nut structure.
- C. 12 to 20 inches, brownish-yellow strongly plastic silty clay spotted with yellow and gray and containing unweathered shale fragments; layer underlain by bedrock.

ALLUVIAL SOILS

Alluvial soils are an azonal group of soils developed from transported and relatively recently deposited material (alluvium) that is characterized by weak modification (or none) of the material by soil-forming processes (10). In Decatur County these soils are on first bottoms along streams and on foot slopes. They have nearly level or gently sloping relief and good to very slow internal drainage. Their main properties in common are those related to a lack of a soil profile in which the horizons are genetically related.

Alluvial soils derived from similar parent material may differ in drainage and in characteristics arising from drainage. Alluvial soils are derived from similar parent materials and have been differentiated mainly on the basis of properties associated with good, imperfect, or poor drainage.

Huntington, Lindside, and Melvin Series

The Huntington, Lindside, and Melvin soils are derived from young general stream alluvium washed chiefly from soils underlain by limestone materials. All of these soils are nearly level. They have formed under hardwood forests, but the association of trees varies somewhat among the soil series, depending on differences in drainage. Other soil differences are also closely associated with differences in drainage. All the soils are young and do not have developed profiles. In general, they are higher in bases, phosphorus, nitrogen, and humus than the associated zonal soils of the uplands.

The Huntington soil is brown silt loam to a depth of 24 inches or more, below which the material is spotted with gray and yellow. In many places, the upper part, or to a depth of 8 to 12 inches, is brown mellow silt loam and the lower part is light-brown friable silty clay loam. This difference between layers may be partly caused by soil-forming processes but is more likely caused by deposition.

The Lindside soils are intermediate in drainage between the well-drained Huntington soil and the poorly drained Melvin soil. The material composing the Lindside soils is generally thought to have originated in the same areas as that of the Huntington soil. In general the Lindside soils consist of mellow brown silt loam that extends to a depth of about 12 inches. Below this depth the material is similar

or slightly heavier textured, but it is highly mottled with gray, yellow, and rust brown, indicating that it is waterlogged much of the time.

The Melvin is a poorly drained soil associated with Huntington, Lindside, and Egam soils. Most of the material composing the Melvin soil is thought to have originated in the upland underlain by limestones, but considerable variation was allowed in the mapping. The Melvin soil is prevailingly light colored and highly mottled from the surface downward.

Egam Series

The Egam is a dark moderately well-drained soil of the high first bottoms along the Tennessee River. The alluvium is similar in origin to that of the Huntington soil, but it was deposited in slack water or where the rate of flow was very slow and sediments consisted of much heavier materials. Egam silty clay loam has a dark grayish-brown to almost black moderately plastic silty clay loam surface soil to a depth of about 12 inches. The material below this depth consists of a moderately compact grayish-brown to yellowish brown silty clay loam. The differences between surface soil and subsoil are probably partly the result of soil-forming processes. The Egam soil, however, is only weakly modified by soil-forming processes and is classified as an Alluvial soil.

Bruno Series

The Bruno soils, on first bottoms of the Tennessee River, consist chiefly of material washed from soils of the upland underlain by sandstone or sandy Coastal Plain material. They occur chiefly on the high natural levees. The Bruno soils consist of material deposited by swiftly flowing floodwaters that were depositing chiefly coarser particles. These sediments were apparently influenced considerably by limestone materials. Bruno loamy fine sand consists of light-brown or yellowish-brown loose loamy sand to a depth of about 12 inches. The material below this depth is a brownish-yellow or light-brown loose loamy sand.

Ennis Series

Soils of the Ennis series are young. They formed from materials washed from soils of the uplands underlain by cherty limestones. They are along all the major streams in the cherty Limestone Hills section. The parent materials have not been significantly altered by soil-forming processes, so Ennis soils are classified as Alluvial soils.

The Ennis soils, like the Huntington soil which they resemble, are well drained and predominantly brown. They are lighter textured and, in general, lower in bases, phosphorus, nitrogen, and humus than the Huntington soil. The Ennis soils are characterized by varying quantities of chert fragments throughout the profile. They consist of brown to grayish-brown silt loam to about 12 inches. Below this depth the material is light-brown friable silt loam that has some splotches of gray below about 24 inches. Beds of chert fragments are at a depth of 3 to 5 feet in most places. The cherty Ennis soil has water-worn chert fragments in the plow layer that interfere materially with cultivation.

Shannon, Hymon, and Beechy Series

The Shannon, Hymon, and Beechy soils have formed from alluvium consisting of a mixture of materials washed from soils of the uplands underlain by loess and Coastal Plain materials. All of these soils are very young and have developed no definite genetic horizons. All receive deposits of alluvial materials during floods. The soils differ from the Huntington, Lindside, and Melvin in being derived from materials washed from loess and Coastal Plain sand and clay rather than limestone and are generally lighter in texture and color, more acid, and lower in bases, phosphorus, and nitrogen. The Shannon soils are brown and well drained. The imperfectly drained Hymon soils are grayish brown or light brown to a depth of about 12 inches and highly mottled with gray, yellow, and rust brown below that depth. The Beechy soils are poorly drained, prevailingly light colored, and mottled with various shades of gray and brown from the surface downward. All these soils are azonal; they belong to the Alluvial soils great soil group.

Emory Series

The Emory soil occurs along foot slopes and benches at the base of upland slopes, chiefly along intermittent streams. It has developed from local alluvium and colluvium washed from Talbott and Maury soils, with which it is closely associated geographically. Relief is nearly level to gently sloping. The soil developed under hardwood forests and a climate similar to that under which associated zonal soils were formed, but its materials were so recently deposited that soil-forming processes have not had time to act. No genetic profile has developed. The Emory soil is young and is included with the Alluvial soils.

Profile of Emory silt loam :

1. 0 to 10 inches, brown mellow silt loam with a weak fine crumb structure; in many places, material is apparently a very recent accumulation washed from adjoining upland slopes; upper 2 or 3 inches of virgin soil is stained dark with organic matter.
2. 10 to 30 inches, light-brown, brown, or reddish-brown friable silt loam or silty clay loam.
3. 30 to 40 inches, yellowish-brown to reddish-brown friable silt loam or silty clay loam spotted with gray; bedrock at 4 to 6 feet in most places.

Greendale Series

Greendale soils are on foot slopes along intermittent streams and on alluvial-colluvial fans. Their parent materials consist of local alluvium and colluvium washed chiefly from Bodine soils. Relief is nearly level to sloping. The materials from which Greendale soils have developed were recently deposited, and in most places material from the adjoining upland slopes is frequently added. As a result, the soils are young and generally have little profile development. In Decatur County, the Greendale soils are so young and have such indistinct or weakly developed profiles that they are included in the Alluvial great soil group.

Profile description for Greendale cherty silt loam soils :

1. 0 to 10 inches, grayish-brown to brownish-gray friable cherty silt loam.
2. 10 to 20 inches, yellowish-brown friable cherty silt loam or light cherty silty clay loam.
3. 20 inches+, brownish-yellow very cherty silt loam spotted with gray.

Tigrett and Briensburg Series

The soils of the Tigrett and Briensburg series have formed from recent local alluvium or colluvium washed from soils of the adjacent slopes underlain by loess. In most places additional materials are being added. The soils are on gently sloping areas at the base of slopes from which their materials have washed. External drainage is moderate, but internal drainage varies from slow to moderate. The parent materials are young, and the forces of climate and vegetation have not affected them to such extent that the soils have genetically related horizons. The Tigrett soil is brown or grayish-brown, well-drained, and free of mottlings to a depth of 24 to 46 inches. The imperfectly drained Briensburg soil is grayish brown but highly mottled with gray, yellow, and rust brown below about 16 inches. Both are Alluvial soils.

Alva and Eupora Series

The Alva and Eupora soils have formed from recent local alluvium or colluvium consisting of a mixture of loess and Coastal Plain materials. They differ from the Tigrett and Briensburg soils chiefly in having parent materials that contain an admixture of Coastal Plain materials. In most places additional materials are being added. The soils are on gently sloping areas at the base of slopes from which their materials have washed or sloughed. External drainage is moderate, but internal drainage varies from slow to moderate. The parent materials are so young that the forces of climate and vegetation have not had time to develop genetically related horizons. The Alva is a brown or grayish-brown well-drained soil free of mottlings to a depth of 24 to 36 inches. The imperfectly drained Eupora soil is grayish brown, but highly mottled with gray, yellow, and rust brown below about 16 inches. These are Alluvial soils, and of the azonal order.

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