How to Use THE SOIL SURVEY REPORT

FARMERS who have lived in one locality for a long time come to know about the soil differences on their own farms and on those of their immediate neighbors. What they do not know, unless a soil survey has been made, is how nearly their soils are like those at experiment stations or in other localities from which higher yields are reported. They do not know whether crop uses and fertilizer requirements of the experimental areas are applicable to their soils. Soil similarities and differences are known only after a map of the soils has been made. Knowing what kind of soil one has and comparing it with soils on which new developments have proved successful will remove some of the risk in trying new methods and varieties.

SOILS OF A PARTICULAR FARM

To find what soils are on any farm or other tract of land, locate the tract on the soil map. This is easily done by finding the township, section, and quarter section the farm is known to be in and locating its boundaries by such landmarks as roads, streams, villages, and other features.

Each kind of soil is marked with a symbol on the map. For example, all soils marked HfU are of the same kind. To find the name of the soil so marked, look at the legend printed near the margin of the map and find the symbol. The color where HfU appears in the legend will be the same as where it appears on the map. The HfU means Hartsells fine sandy loam, undulating phase. A section of this report tells what Hartsells fine sandy loam, undulating phase, is like, for what it is mainly used, and some of the uses to which it is suited.

How productive is Hartsells fine sandy loam, undulating phase? Find this soil name in the left-hand column of table 27 and note the yields of the different crops opposite it. This table also gives expected yields for all the other soils mapped so that the different soils may be compared.

Read in the section on Soil Types and Phases to learn what are good uses and management practices for this soil. Look also at the section headed Use and Management of Important Soil Groups. Here soils suited to about the same use and management practices are grouped. Find the group that contains Hartsells fine sandy loam, undulating phase. What is said about rotations, liming, fertilizing, drainage, erosion control, and other management practices applies to this soil.

SOILS OF THE COUNTY AS A WHOLE

If a general idea of the soils of the county is wanted, read the introductory part of the section on Soils and the section on Soil Associations. These tell where the principal kinds of soils are found and describe the broad sections of the county that differ from each other in the nature and distribution of the soils. Within each broad section, or soil association area, there is likely to be a particular type of farming or land use.

A newcomer who considers purchasing a farm in the county will want to know about the climate as well as the soils; the types and sizes of farms; the principal farm products and how they are marketed; the kinds and conditions of farm tenure; kinds of farm buildings, equipment, and machinery; availability of schools, churches, highways, railroads, telephone and electric services, and water supply; industries; and town, villages, and population characteristics. This information will be found in the sections on General Nature of the Area and on Agriculture.

Students and others 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 Jackson County, Ala., is a cooperative contribution from the—

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and the

TENNESSEE VALLEY AUTHORITY

Series 1941, No. 8 Issued March 1954

SOIL SURVEY OF JACKSON COUNTY,[1] ALABAMA

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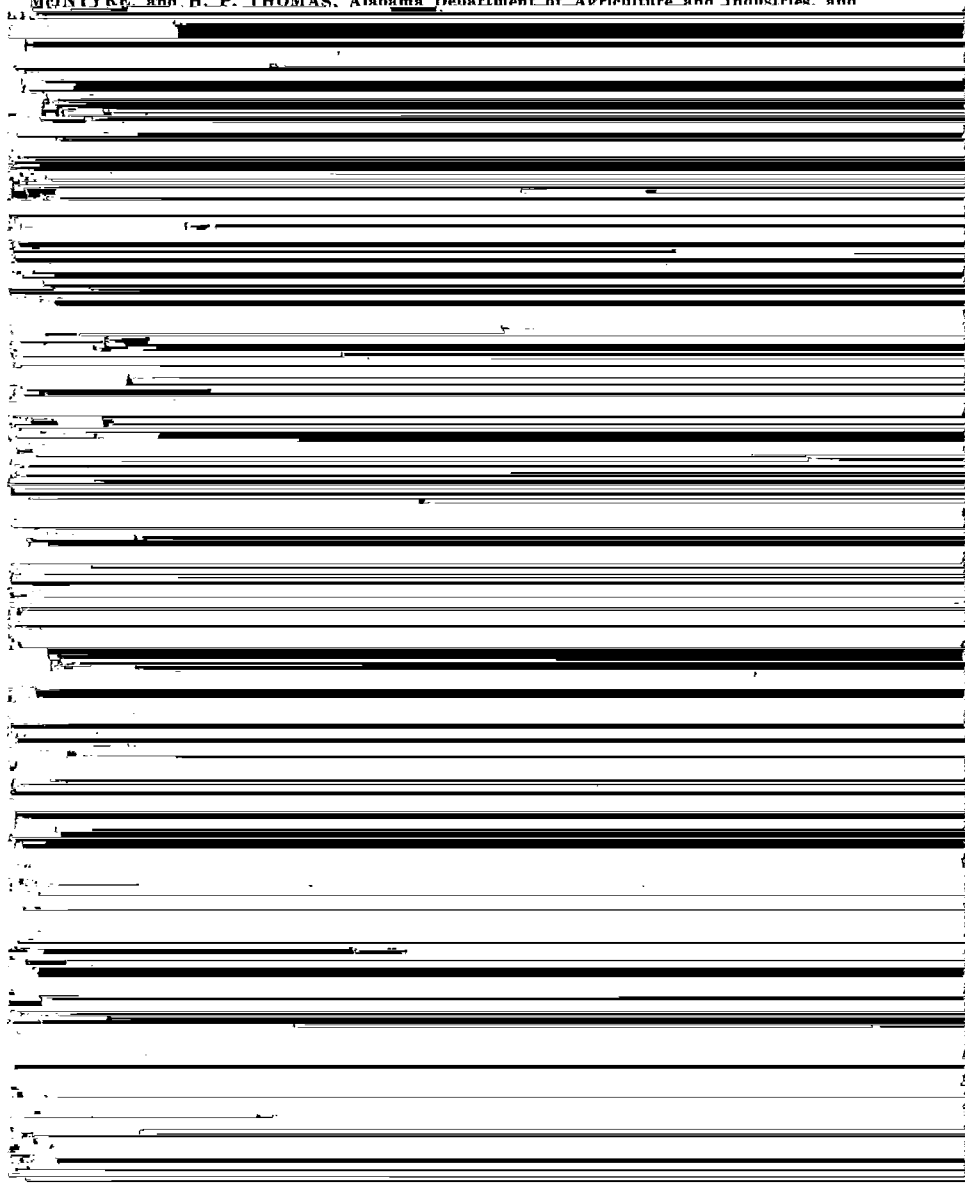


JACKSON COUNTY, one of the largest counties in Alabama, is in the Tennessee River Basin. It has a humid, mild temperate continental climate suitable for a wide variety of crops. From the time of early settlement farming has been the major occupation. Cotton is the principal cash crop, although corn surpasses it in acreage. Hay is grown on large areas. Much of the county not suitable for crops is in forests, which form a supplementary source of income. To provide a basis for the best agricultural uses of the land this cooperative soil survey was made by the United States Department of Agriculture, the Alabama Department of Agriculture and Industries, the Alabama Agricultural Experiment Station, and the Tennessee Valley Authority. Field work was completed in 1941, and, unless otherwise specifically mentioned, all statements in this report refer to conditions in the county at that time.

GENERAL NATURE OF THE AREA

LOCATION AND EXTENT

Jackson County, in the northeastern corner of the State (fig. 1), is

under water, chiefly Guntersville Reservoir. Scottsboro, the county seat, located in the south-central part, is 95 miles northeast of Birmingham and 165 miles north of Montgomery, the State capital.

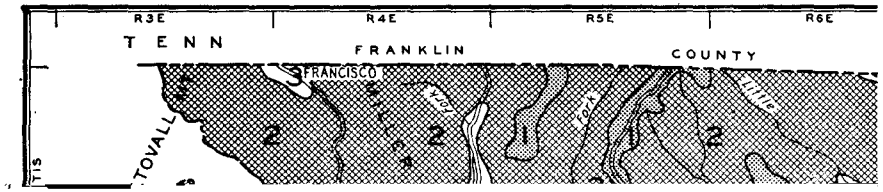
PHYSIOGRAPHY, RELIEF, AND DRAINAGE

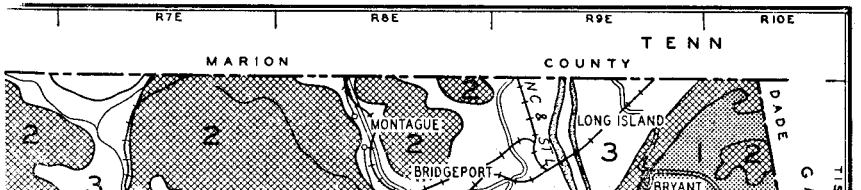
The county is in the Cumberland Plateau section of the Appalachian Plateaus physiographic province (*4*).[3] Before it was dissected by streams the area was mainly a nearly level plain gently inclined toward the south. A narrow upward fold, the Sequatchie anticline, however, extended from northeast to southwest. This anticline later eroded and left the broad regular valley traversed by the Tennessee River. The extensive, more level-bedded formations have been dissected, leaving three general physiographic divisions: (1) Sandstone plateaus, (2) rough mountain slopes, and (3) limestone valleys (fig. 2).

The sandstone plateaus include chiefly two areas, Sand Mountain in the southeastern part and Cumberland Plateau in the north central part. Smaller sandstone plateaus elsewhere in the county consist chiefly of smooth sandy soils moderately deep to sandstone bedrock. Much of the Sand Mountain area is cleared and farmed under a relatively high level of management. Parts of Cumberland Plateau are cleared and used for general farming, but extensive areas are still under forest. Elevations on the plateaus range from 1,300 feet on the southern part of Sand Mountain to 1,700 feet or more in the northern part.

Rough mountain slopes are widely distributed and constitute most of the area northwest of the Tennessee River Valley. These slopes are steep and stony or rocky. The rocks are chiefly of limestone and sandstone, although limestone predominates. The lower parts of the slopes are of limestone, whereas the upper parts are of sandstone. These steep areas are valued mainly for the production of timber and cedar posts.

The limestone valleys section (pl. 1, *A*) consists of valleys of the Tennessee and Paint Rock Rivers and the narrow valleys along the larger tributary streams. The Tennessee River valley is 4 to 5 miles wide and has a nearly level to strongly rolling surface interspersed with cherty ridges. More than half the nearly level first-bottom land along the Tennessee River, which ranges up to about 1 mile wide, is flooded by the Guntersville Reservoir. A large part of the Tennessee River valley is cleared, although some areas poorly suited to agriculture are in forest. Much of the Paint Rock River valley, which in most places is not more than a mile wide, is a smooth alluvial plain, parts of which are poorly drained.


R3E
R4E
R5E
R6E
T E N N
FRANKLIN
COUNTY
FRANCISCO
TOVALL
T1S


R7E
R8E
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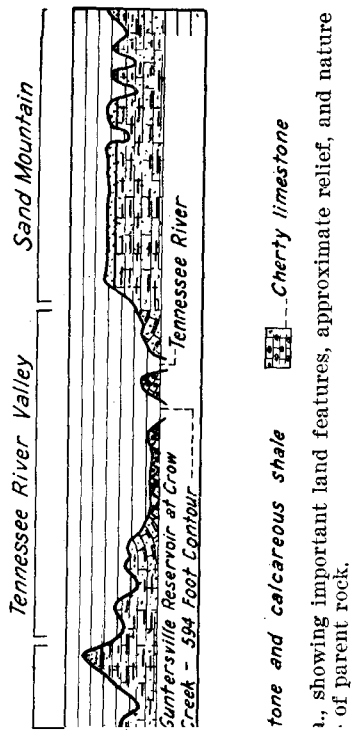
R10E
T E N N
MARION
COUNTY
MONTAGUE
BRIDGEPORT
LONG ISLAND
BRYANT
DADE
GA
COUNTY
T1S
EUREKA
STEVENSON
ALLEY
N.C. & ST. L. RY.
SOU. RY.
Crow Creek
Coon Creek
Widows Cr.
FERRY



., showing important land features, approximate relief, and nature
of parent rock.

The county lies within the Tennessee River drainage basin. Most of the tributary streams originating in the plateau areas have cut deep gorges where they emerge from the plateaus. These channels form great V-shaped ravines or rock-walled gorges that separate the plateau. Except in the Tennessee River valley, the drainage pattern is dendritic. Drainage is generally well developed on the plateaus; most drainageways have rapid runoff, especially in the lower levels near the plateau rims where the waters go headlong down much steeper slopes. As the water cascades over the ledges and precipices, it breaks into smaller streams that may continue as individual streams to the slope base or may reunite farther down the slope. Occasionally the water in the drains empties into sinks and reappears at some lower point from springs or underground streams.

Surface drainage in the Tennessee River valley varies greatly. The cherty ridges and the higher stream terraces have well-developed drainage, whereas drainage is only weakly developed in extensive areas of low smooth upland over argillaceous limestone, low stream terraces, and first bottoms. A small part of the runoff in the cherty ridges ends in sinkholes. Although the flow of the Tennessee River is stabilized sufficiently to nearly eliminate overflow, tributary streams within the

The sandstone member of the Pottsville formation is largely the parent rock of the soils of the plateaus—the Hartsells, Crossville, Hanceville, Enders, Muskingum, and Pottsville soils. The shale member of this formation, which consists of partly indurated gray shale, in places carries one or more coal seams, some of which are of economic significance. In other places the shale is very dark gray to nearly black, owing to its high carbonaceous content. In this area, Pottsville shale is not important as a source of soil parent material, although some soils—mainly the Pottsville and Enders—are influenced by or derived from it. Pottsville shale is important chiefly as a carrier of coal seams.

The Bangor formation underlies the Pottsville and is mainly a blue coarsely crystalline or oolitic finely granular limestone with occasional shale strata or lenses. It is several hundred feet thick and occurs in beds or massive layers that outcrop chiefly on the mountainous slopes. The hilly and rough types of limestone rockland predominate on this rock. Soil material weathered in place over these rocks is relatively thin, apparently because of the predominantly strong slope and consequent rapid removal of the material by geologic erosion. This material, however, is an important component of the soils on the colluvium and alluvium of the valleys.

Other formations that have less extensive exposures in the deeper valleys and the chert ridges along the Tennessee River possibly are of Fort Payne chert. In the Paint Rock River valley, limestone, probably the Warsaw of the Mississippian system, outcrops on the lower slopes. The soil materials derived from these formations are distinguishable from those derived from the Bangor by their percentage of chert and fossils. The chert is especially noticeable on the surface, where it occurs as angular fragments ranging from gravel to blocks measuring more than 8 inches. Numerous rounded to dumbbell-shaped accretions of bluish-gray to nearly black flint up to 4 inches or more in diameter are intermixed with the chert fragments in places in the upper Paint Rock River valley. Fullerton soils have developed over the cherty limestone material.

In the Tennessee River valley, material of the Silurian, Ordovician, and possibly Upper Cambrian systems is exposed as a part of the Sequatchie anticline. The Red Mountain formation of the Silurian occurs as red serrated hills along the Tennessee River and gives rise to Armuchee and Tellico soils. Chickamauga limestone of the upper part of the Ordovician system is exposed as smooth uplands in a valley position west of the serrated hills. The heavy and plastic clay material weathered from this limestone is the source of Talbott and Colbert soils and those stony land types derived from limestone material. Longview limestone, part of the Knox dolomite of the Lower Ordovician or the Upper Cambrian system, is exposed as chert ridges from which the Fullerton, Clarksville, and limited areas of Dewey soils originate.

Many of the geologic formations outcropping in the valleys are covered by alluvium that varies greatly in age, depth, and composition. The formations of alluvium in the Tennessee River valley consist of mixed material transported from a broad area including considerable parts of the Cumberland Plateau, the Blue Ridge province, and that part of the Ridge and Valley province known as the Great Valley.

The higher lying stream terraces in general are old, and their mature soils vary in depth from a thin mantle to 20 or 30 feet. Other stream terraces are younger. The first bottoms along the Tennessee River are young and were subject to periodic floods until the system of dams was constructed by the Tennessee Valley Authority. The alluvium in the Paint Rock River valley and the tributary valleys generally is young and consists predominantly of a mixture of materials derived from sandstone and limestone.

CLIMATE

According to Koppen's classification (*12*), Jackson County lies within the humid mesothermal zone having a humid temperate climate with no dry seasons but hot summers. In general, the climate is humid, mild, temperate, and continental and has a wide range in temperature over a period of years. The extremes however, are not commonly reached or even approached annually.

At Scottsboro the average date of the last killing frost in spring is April 6 and the first in fall, October 31, giving an average frost-free period of 207 days. The latest recorded frost date in spring is May 10, and the earliest in fall, October 11. No temperature records are available for the plateaus.

The winters usually have temperatures below freezing at night in December, January, and February. Winter days with temperatures remaining below freezing are few. Snow is common on the plateaus. It usually does not remain long on the ground, but there have been a few seasons when it remained several weeks, even in the valleys. Summers are long and sometimes hot, but nights are generally cool. The average annual precipitation at Scottsboro is 52.65 inches. Floods are most common from December 15 to April 15, although they may occur any time.

The climate is favorable for most crops, but some may be damaged by too wet or too dry weather. The total loss of all crops, however, has never occurred. Short periods of very dry or very wet weather are common. Dry conditions prevail from midsummer to late fall, but severe droughts over long periods are unusual. Severe windstorms are relatively rare. Electrical storms are fairly common but seldom cause serious loss.

Winters are mild enough for the successful growth of some winter cover crops. The growing season is long enough to allow the cover crop to be turned under after it has developed a good growth in spring, and another crop can then be grown to maturity before killing frosts. Well-managed pasture is productive for 8 to 10 months. Native grasses

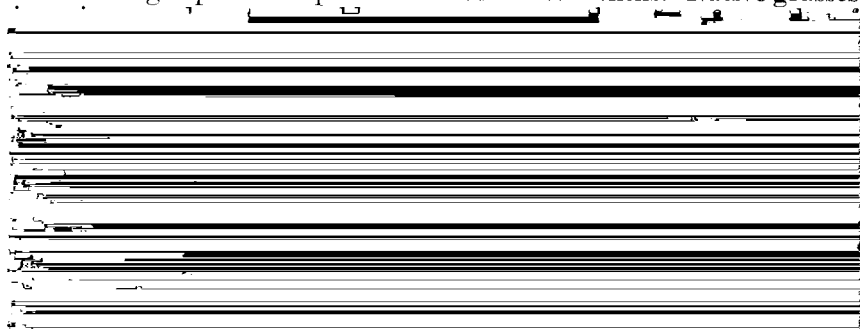
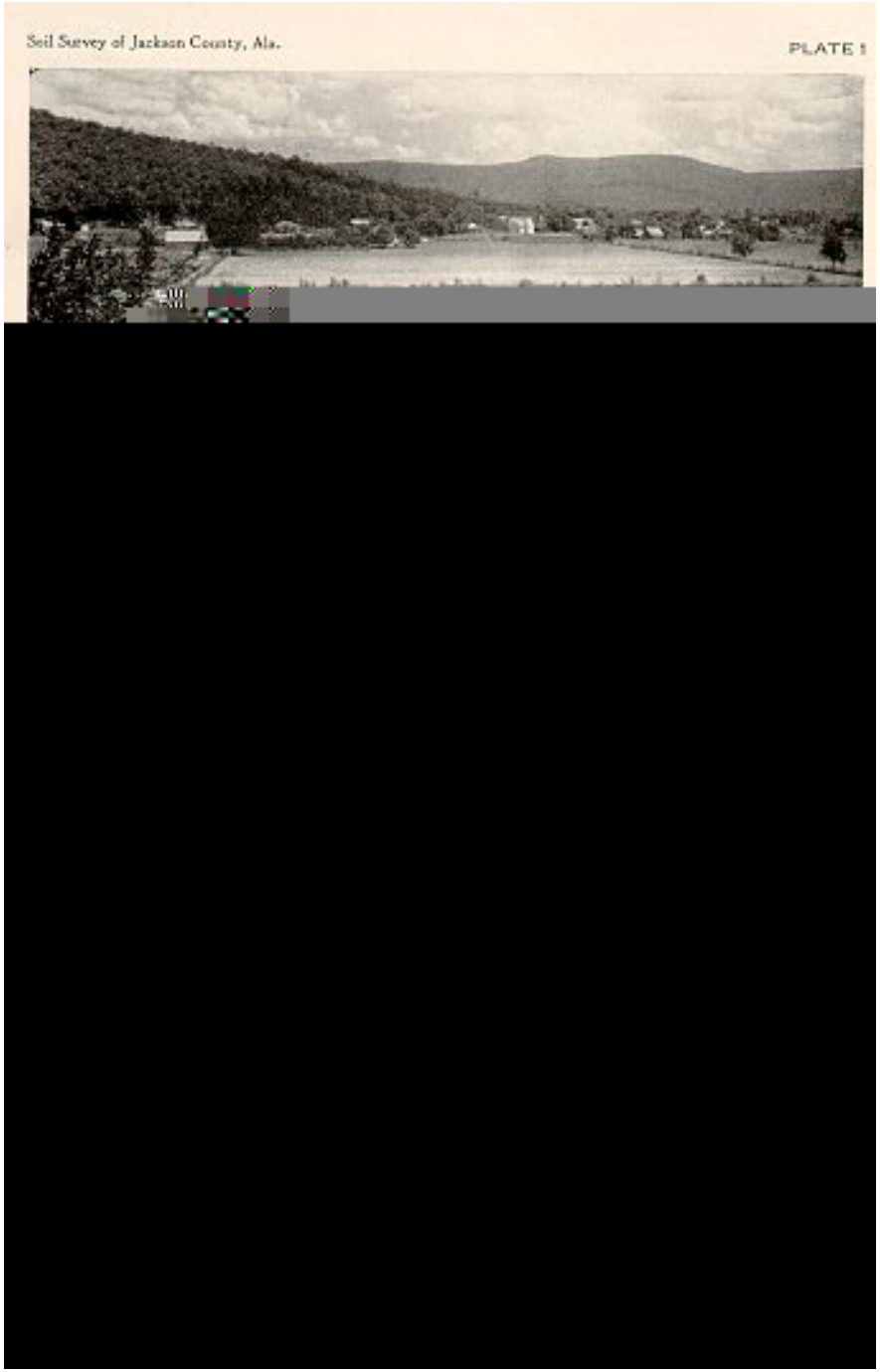
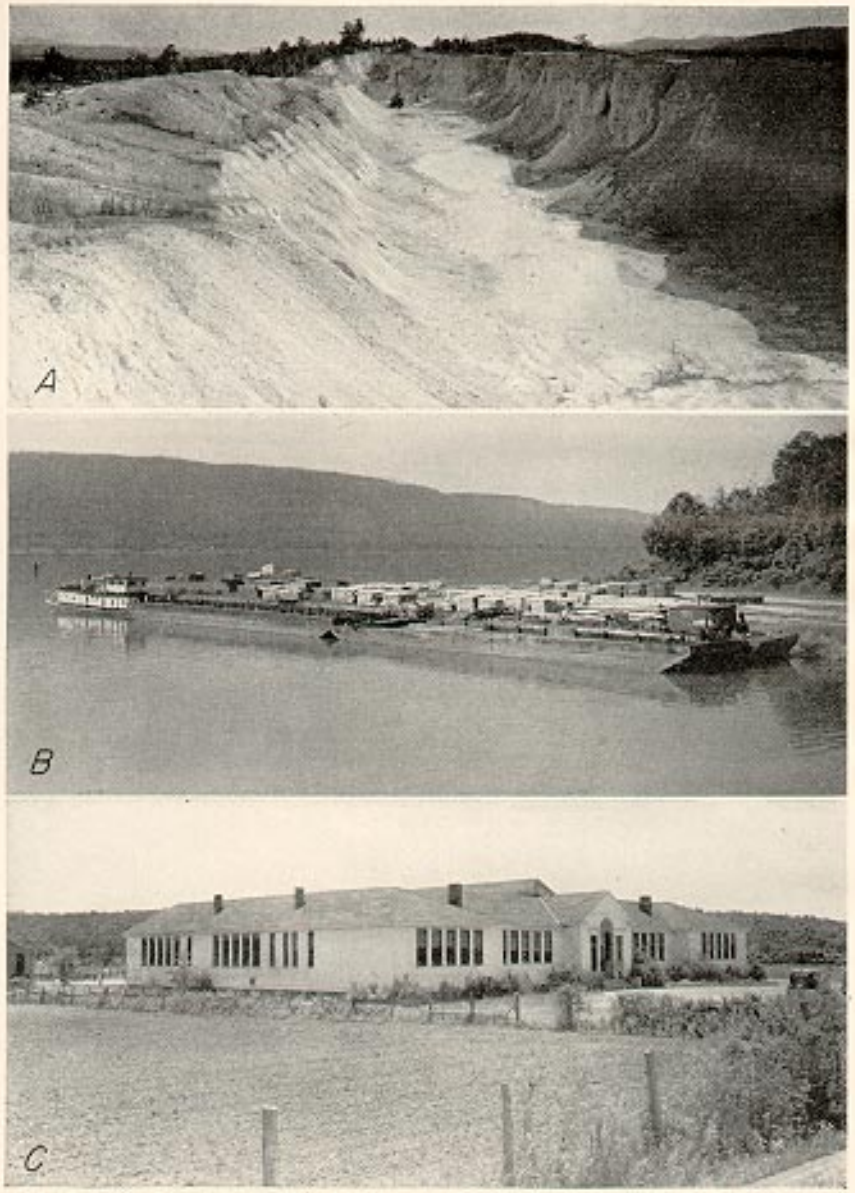


TABLE 1.—*Normal monthly, seasonal, and annual temperature and precipitation at Scottsboro, Jackson County, Ala.*

[Elevation, 652 feet]

Month	Temperature			Precipitation			
	Mean	Absolute maximum	Absolute minimum	Mean	Total for the driest year	Total for the wettest year	Average snowfall





A, Excavation of cherty material in a Fullerton-Clarksville-Greendale soil association area.
B, Shipping lumber products on the Tennessee River.
C, Consolidated elementary school at Woodville.

Guntersville Reservoir serves for boating, fishing, swimming, and

facilities on the Tennessee River are at Guntersville in Marshall County and at Chattanooga, Tenn.

Two railroads serve the county. The Nashville, Chattanooga & St. Louis Railway, built between 1851 and 1853 from Nashville to Chattanooga, traverses the northeastern part of the county. The Southern Railway, which was originally the Memphis and Charleston Railroad completed in 1856, runs through the central part and forms the main line between Memphis and Chattanooga. Most of the valleys in the county have access to these railroads, but the upper Paint Rock River valley and the plateaus are less adequately served.

The most heavily traveled highways are hard-surfaced or paved. Relatively adequate highways accommodate the Sand Mountain area and the valleys of the Tennessee and the Paint Rock Rivers and their larger tributaries. Highway facilities are less adequate for the Cumberland Plateau area. Bus lines operate to outside points. Connections can be made from Scottsboro to Chattanooga, Huntsville, Guntersville, Rosalie, and Fort Payne. Motor freight service is also maintained over the main highways. Cotton, cottonseed, fertilizer, and other products are trucked into and from the county largely by commercial truckers, but many farmers do their own hauling. Most fertilizer dealers deliver to the farmers.

FARM, HOME, AND COMMUNITY IMPROVEMENTS

Dwellings in the rural areas, especially in the valleys, range from large fairly well-built houses on the larger plantations or more prosperous farms to poor or very poor houses on some of the smaller or tenant farms. Farm dwellings and other farm buildings on Sand Mountain are better than those in the valleys. On Cumberland Mountain farms the dwellings are a standard type constructed as a part of the resettlement project. The difference between the better and poorer homes is greater in the valleys than on the mountains.

and other vegetables were among the first crops planted. When land was available small patches of wheat and cotton were planted. Many farmers found that lands they first improved became depleted of pro-

less than half of it is harvested for peas. In addition to the regular acreages, both cowpeas and soybeans are grown to some extent with other crops.

Sericea lespedeza is rapidly becoming one of the most important hay crops because it is a perennial and does not require planting annually. Also, it produces a large quantity of good, easily cured hay, is adapted to most soils of the county, and is good for grazing. Alfalfa is becoming more popular on the mountains as well as in the valleys. Medium red clover has been fairly widely used as a hay crop, especially in the Paint Rock River valley. Some is grown in other valleys and a little on the plateaus. A small part of the red clover crop is harvested for seed by small combines.

Potatoes, sweetpotatoes, and sorghum for sirup have varied in both acreage and yields. These crops have been of great importance as food in farm homes and as a supply for local demands. Recently the production of potatoes on Sand Mountain has increased, and on some farms potatoes are an important commercial crop (pl. 3, A).

TABLE 2.—*Acreage of principal crops and number[1] of fruit trees and grapevines in Jackson County, Ala., in stated years*

Crop	1919	1929	1939	1944
	Acres	*Acres*	*Acres*	*Acres*
Cotton	41, 615	56, 426	33, 103	36, 483
Corn	89, 932	64, 334	78, 871	81, 477
Wheat	798	131	114	920
Oats	583	60	191	82
Rye	20	16	10	79
Soybeans	(2)	9, 508	12, 719	14, 962
Cowpeas	632	1, 809	1, 967	2, 679
Peanuts	66	117	240	474
All hay	19, 998	17, 684	25, 866	23, 126
Annual legume hay	8, 954	12, 990	[3] 13, 348	[3] 15, 277
Lespedeza	(2)	(2)	10, 750	6, 410
Clover and timothy alone or mixed	(2)	1, 373	383	416
Alfalfa	(2)	61	116	96
Small-grain hay	3, 496	478	126	88
All other tame hay	6, 601	1, 147	222	552
Wild hay	947	1, 000	237	287
Potatoes	547	686	1, 330	1, 629
Sweetpotatoes	506	402	663	422
Sorghum for sirup	853	424	944	(2)
	Number	*Number*	*Number*	*Number*
Apples—trees	59, 463	33, 941	23, 361	37, 864
Peaches—do	29, 970	36, 569	29, 899	47, 759
Pears—do	2, 612	2, 230	2, 693	3, 944
Plums and prunes—do	4, 847	1, 506	1, 900	1, 378
Grapevines	4, 900	5, 118	6, 725	12, 439

[1] Number of fruit tree and grapevines of bearing age given for all years except

other nitrogen fertilizer. Because oats usually follow cotton or potatoes, crops that have been fairly heavily fertilized with phosphate and potash fertilizer, they do not receive applications of complete fertilizer.

PERMANENT PASTURE

Much permanent pasture is on land not well suited to crops, and only a small part is on land suitable for tillage. In the valleys the pasture is usually on erodible areas bordering the rough limestone slopes, low limestone ridges or stony land of limestone origin, steep slopes, eroded rough gullied lands, and wet lands or first bottoms subject to severe flood hazard. Inaccessible plowable lands, as those bordering the Guntersville Reservoir, are also used for permanent pasture. On the other hand, many farmers are using some of their best cornland for pasture.

In the chert-ridge areas, pastures include practically all except the better situated plowable lands on the more gentle slopes and the wider ridge tops. The lower shaly slopes of the red hills along the Tennessee River and in places the entire hills are used for permanent pasture. The crests and upper slopes, however, are usually wooded. The permanent pasture is on the steeper slopes on the mountain or plateau areas; on bottom lands along the drains, especially those that remain wet most of the time; on benchlands below the escarpments; and on shallow stony lands. In great part the mountain slopes, however, are under forest and are not used for pasture.

Most of the permanent pasture has been cleared of underbrush and trees and supports a mixed growth of native grasses and plants, especially wild legumes, or introduced grasses and plants that have become so well established that they can be considered native. The varieties of plants differ according to the dominant moisture condition. The low wet areas support more water-loving plants. Some difference in varieties can be traced to the absence or presence of lime in the soil.

Among the more common pasture plants and grasses in the cleared but otherwise unimproved pastures are broomsedge, crabgrass, Bermuda grass, Dallis grass, Johnson grass, hurrah grass and other water-loving grasses, and common lespedeza, partridge-pea, wild sericea lespedeza, and other wild legumes. Under favorable conditions, small patches of sweetclover, white clover, and Kentucky bluegrass may occur in unimproved pasture, but these plants seldom maintain a good stand except when the pastures are improved with fertilizer and amendments.

Many permanent pastures have been, and some still are, badly infested with noxious weeds, some of which not only crowd out the better pasture grasses and plants but are very objectionable for their effect on dairy products. The more common weeds or pests are bitterweed, wild onion, dogfennel, yellowtop, ox-eye daisy, bullgrass, and bullnettle. Broomsedge is usually considered more as a pest than a pasture grass, but some forage is obtained from the young shoots.

Although most of the pastures are classed as unimproved, progressive farmers and agricultural workers have done a considerable amount of work to establish improved permanent pastures. Many farmers mow their permanent pastures late in summer and early in fall to remove coarse weeds and briers. The acreage in improved pasture

is not large but is well distributed over the county so that the results can be observed by all farmers. Some improved pastures are on sandy soils of the plateaus (pl. 3, *C*), and some are on various valley soils.

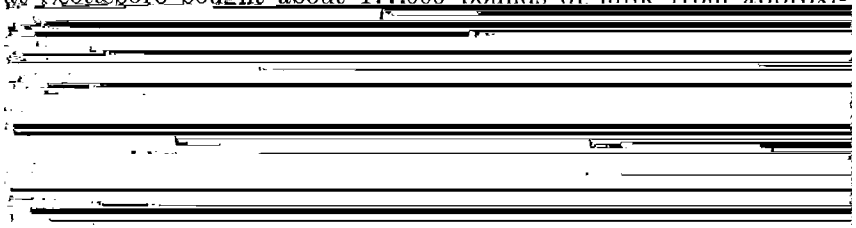
The program recommended for the sandy soils on the mountains differs only partly from that recommended for the soils of the valleys. In general it calls for a well-prepared seedbed fertilized with 1 ton of basic slag or 1,000 pounds of 16-percent superphosphate and 1 to 3 tons of finely crushed limestone. The recommended seed mixture consists of 10 pounds of common lespedeza, 5 pounds of Kentucky bluegrass, 5 pounds of orchard grass, 5 pounds of Dallis grass, and 2 pounds of common white clover an acre. To this mixture is added 5 pounds of redtop when low wet areas or wet seepy slopes on the mountains are to be seeded. Fescue may be good, particularly for wetter places.

LIVESTOCK AND LIVESTOCK PRODUCTS

The early settlers found the soils in the valleys suitable for pasture grasses and feed crops and recognized the value of raising cattle and hogs both for home supply and market. Large droves of hogs were taken overland to central and southern Alabama for sale to large-plantation owners. Most farmers used oxen for breaking and plowing fields as well as for much of the hauling, but in time they began to substitute horses for many farm purposes. Later, mules replaced most of the oxen, and some of the horses used in field work were used for hauling heavy loads. The advent of the automobile further reduced the number of horses, and the increased use of farm tractors reduced the number of mules. Most of the replacement stock for horses and mules is brought from Tennessee, although the farmers raise a higher percentage of replacement stock than those in most other Alabama counties.

The most popular hog breeds are Poland China, Duroc, Ohio Improved Chester, and Hampshire. Chattanooga, Tenn., is the main market. Many hogs and pigs are bought and sold or traded in Scottsboro, where farm products, cattle, horses, mules, and farm machinery are also sold or traded.

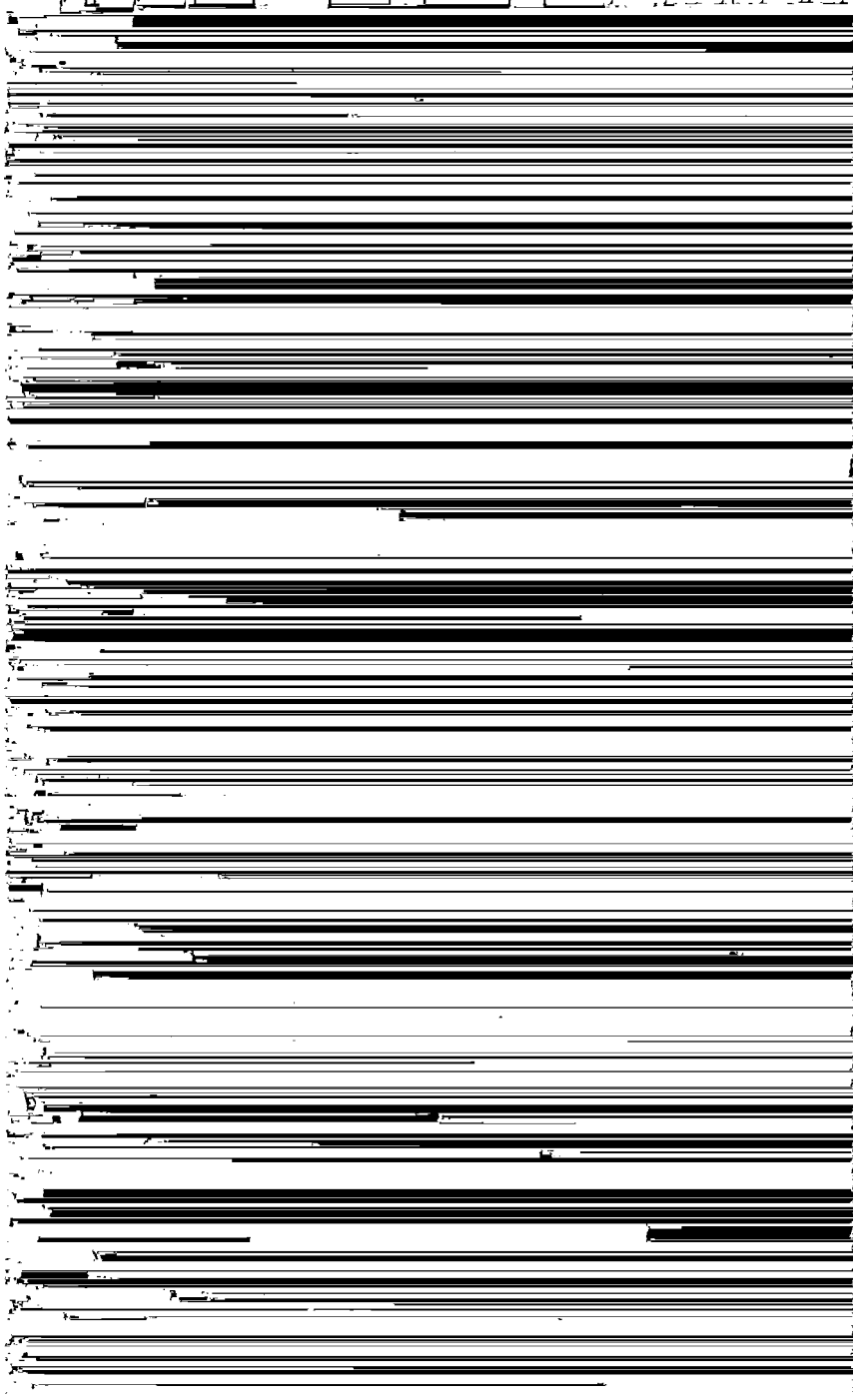
About equal numbers of beef and dairy cattle are raised. Some of the milk cows, however, are grades of beef types. Most farmers keep one or more cows to supply the dairy products needed for home use, and some have a small surplus for sale. Approximately 90 percent of the milk produced is used on the farms or retailed as whole milk and other dairy products direct to consumers by dairies; 3 to 5 percent is churned and sold as butter; a small percentage is sold as butterfat to cream stations; and about 5 percent is sold to the local cheese factory. Dairies supplying the whole-milk retail market in the small towns and villages keep herds of 20 to 40 cows. The cheese factory at Scottsboro bought about 177,000 pounds of milk from approxi-



The percentages of owner-operated farms and tenant-operated farms vary in different parts of the county. In 1945, 54.7 percent of the farms were operated by owners, 45.2 percent by tenants, and 0.1 percent by managers. The total number of tenants in 1940 was 2,602, of which 2,171 were share tenants and croppers, 301 cash tenants, 18 share-cash tenants, and 112 other tenants. According to local information most of the leases are made verbally for 1 year. Longer term written leases are recommended by agricultural workers, but have not come into common use.

In 1945, 2,907 farms derived their major source of income from field crops; 1,463, from farm products used by farm households; 256, from

termed collectively the soil profile. Each of these layers is studied



layers are similar, these soils are considered to belong in the same soil series. A soil series therefore consists of all the soil types that have about the same kind, thickness, and arrangement of layers, except for texture, particularly of the surface layer, whether the number of such soil types be only one or several.

The name of a place near where a soil series was first found is chosen as the name of the series. Thus, Hartsells is the name of a series of well-drained friable strongly acid yellowish-gray soils of moderate to shallow depth to sandstone bedrock. These soils are well distributed over sandstone upland plateaus. Hartsells soils were first recognized and named in Cherokee County, Ala.

When very small areas of 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 called a soil complex. Thus, Philo-Atkins silt loams is a complex of Philo silt loam and Atkins silt loam.

Areas such as stony, rocky, gullied, and rough lands that have little

dulating to very steep. Those over high-grade limestone are deep to bedrock and high in natural fertility. Their slope is predominantly undulating to rolling, but small areas are hilly. Where the soils occur over cherty limestone, they are deep to bedrock and medium to low in fertility. Their surface ranges from undulating to hilly. The soils over argillaceous limestone have compact plastic clay subsoil and a shallow depth, 1½ to 5 feet, to bedrock. They are predominantly smooth and moderately fertile.

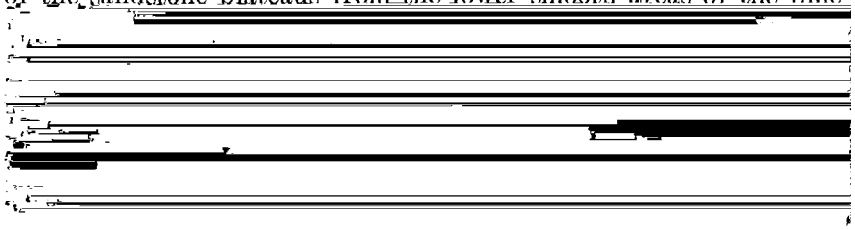
During geologic time soil material has been moved by water and gravity from the place it weathered from the rock. Material that has been moved a short distance either by water or gravity and deposited on adjacent lower slopes and along the heads of drains is designated as local alluvium, and soils on it are commonly designated as soils of the colluvial slopes. The soil material in such areas, therefore, is inherently similar in some respects to that of the soils of the immediately surrounding upland.

Material moved great distances by water and deposited by streams is known as general alluvium and commonly consists of various rock materials. Several kinds of rock are exposed, and some of the alluvium originated in places far removed from the county. General alluvium may be young or old.

Old alluvium, which occurs in the form of benches or stream terraces, represents very old flood plains left by the streams as they cut to lower levels. Soils on these benches are commonly designated as soils of the stream terraces. Being old enough to have formed a well-defined surface layer and subsoil, these soils have profiles that in some respects resemble those of the older soils of the upland.

Young alluvium occurs as first bottoms along streams, and soils on it are commonly designated as soils of the first bottoms. All these soils, like some of those of the colluvial slopes, are young and have not formed a well-defined surface layer and subsoil. Except where protected, they are subject to overflow and further deposition of alluvium.

The slopes in the county range from nearly level to steep; some are 60 percent or more. The most extensive smooth areas are on Sand Mountain; other less extensive ones are in the Paint Rock River valley. The smooth areas on the mountains are ridge tops of variable width that break rapidly to the steep stony valley walls. The first bottoms and lower stream terraces adjacent to the Tennessee River and its larger tributaries are nearly level to gently undulating; the older terraces and cherty ridges, undulating to hilly; and the few shaly ridges, strongly sloping to steep. Most of the steep areas are on the long rugged mountainous slopes that separate the high smooth areas of the sandstone plateaus from the lower smooth areas of the lime-

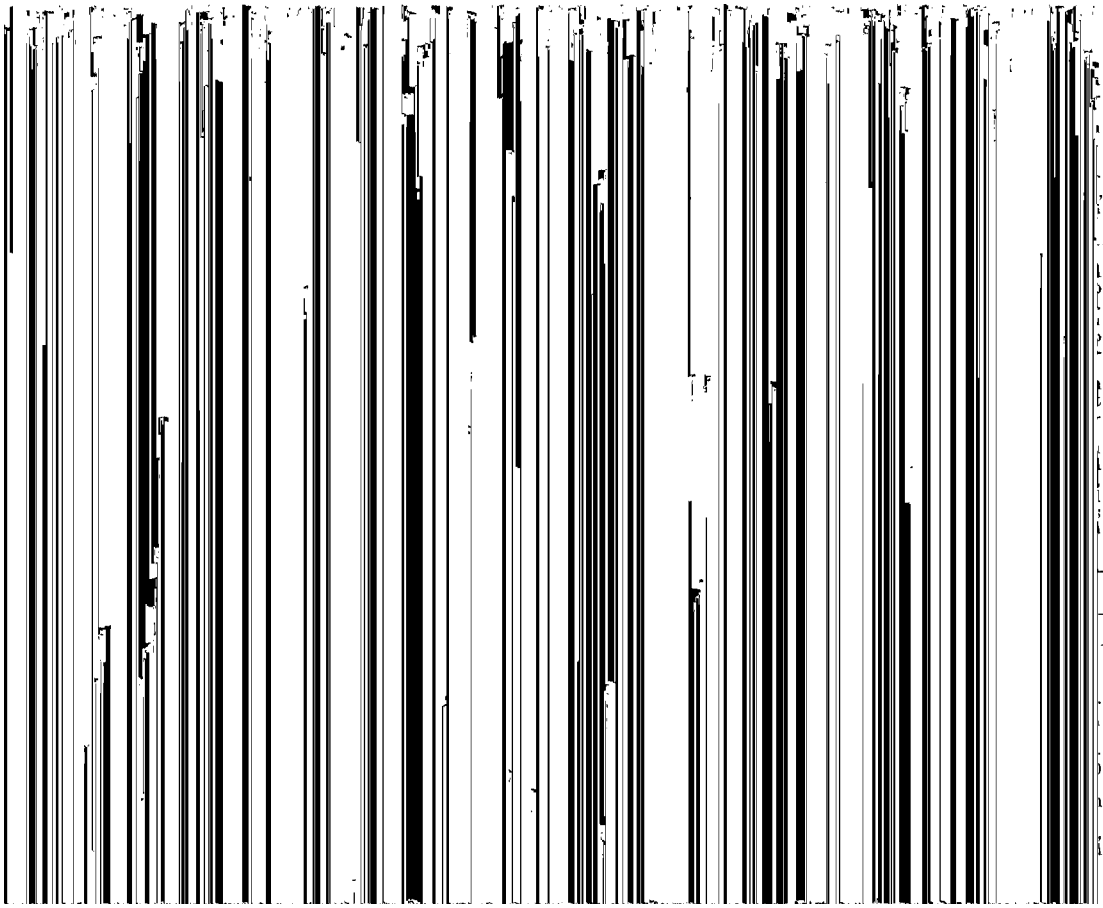


The thickness of the soil over bedrock ranges from a thin layer on the limestone rockland types to 40 feet or more for some areas of first bottom soils, stream terrace soils, and Fullerton and Clarksville

Reaction	Texture	Subsoil consistence
pH 5.8–5.0	Silty clay	ble to firm.
5.8–4.5	Cherty silty clay.	do
5.8–4.5	do	do
5.0–6.2	Clay	y firm
5.5–6.8	do	tremely m.
5.2–4.8	Silty clay	able to ery friable.
5.0–4.8	do	n

TABLE 5.—*Major characteristics of the soil series of Jackson County, Ala.*—Continued

Soil series	Parent rock	Dominant relief	Internal drainage [1]	Depth of profile [2]	Surface soil			Subsoil			Reaction
					Color [3]	Consistence	Approximate thickness [4]	Color [3]	Consistence	Texture	
				Inches			*Inches*				*pH*
SOILS OF SANDSTONE PLATEAUS											
Hartsells	Sandstone, some conglomerate and shale.	Nearly level to rolling.	Moderate to rapid.	26–50	Pale brown or brownish gray.	Very friable	8–12	Very pale brown or brownish yellow.	Friable	Sandy clay loam	4.8–5.5
Enders	Shale and sandstone.	Undulating to rolling.	Moderate	20–45	Light brown to pale yellow.	do	8–12	Pale yellow to reddish yellow.	do	Silty clay	4.5–5.0
Hanceville	Sandstone and conglomerate.	do	do	36–84	Reddish brown to yellowish red.	do	8–12	Yellowish red to reddish brown.	do	Sandy clay	4.8–5.5
Crossville	Sandstone, some shale.	Undulating	Moderate to slow.	12–24	Yellowish brown or brown.	do	7–10	Brown to dark yellowish brown.	do	do	4.5–5.0
Muskingum	Sandstone, some conglomerate and shale.	Hilly to steep	Rapid	12–36	Pale brown or brownish gray.	do	4–6	Very pale brown or brownish yellow.	Very friable	do	4.8–5.5
Pottsville	Shale, some sandstone.	Hilly	Slow	10–30	Light brownish gray or yellowish gray.	Friable	4–10	Pale yellow to yellowish red.	Friable	do	5.2–4.6
SOILS OF COLLUVIAL SLOPES											
Hermitage	Limestone and cherty limestone.	Gently sloping to strongly sloping.	Moderate	36–120	Brown or brownish gray.	Friable	8–12	Yellowish brown to reddish brown.	Firm	Silty clay loam.	5.8–6.4
Greendale	Cherty limestone.	Gently sloping	do	30–60	Grayish brown to light yellowish brown.	do	6–16	Light yellowish brown.	Friable	Silt loam to clay loam.	4.8–5.6
Swaim	Argillaceous limestone.	Gently sloping to sloping.	Moderately slow.	24–60	Yellowish brown to grayish brown.	do	5–8	Yellowish brown to reddish brown.	Very firm	Silty clay	6.8–5.4



	do	Clay	6.8–7.4
	Friable	Silt loam to silty clay loam.	5.6–5.0
	Firm	Silty clay loam.	5.6–5.0
	Firm to very firm.	Silty clay	4.8–5.2
	Friable	Sandy clay	5.8–4.8
	Firm	do	4.6–5.8
	Friable	Fine sandy loam to clay loam.	5.0–4.6
	do	do	5.0–4.6
	Firm	Silty clay loam	4.8–6.0
	Friable	do	5.0–4.6
	do	Silty clay	5.2–4.6
	Firm	do	5.0–6.0
	Very firm or tight.	Silty clay to clay.	5.0–4.6

racteristics of the soil series of Jackson County, Ala.—Continued

SOILS OF STREAM TERRACES—Continued

al e [1]	Depth of profile [2]	Surface soil			Subsoil			Reaction
		Color [3]	Consistence	Approximate thickness [4]	Color [3]	Consistence	Texture	
	Inches			*Inches*				*pH*
very	36–72	Light brownish gray.	Friable	8–12	Pale yellow grading to mottled yellow and gray.	Firm	Sticky clay	5.0–4.6
	24–42	Gray to light gray.	do	6–10	Light gray mottled with yellow and brown.	Firm to very firm.	Silty clay	5.2–4.8
	24–180	Pale brown or grayish brown.	do	6–12	Yellowish red grading to deep red.	Friable	Clay loam	5.8–4.8
to	36–180	Yellowish brown or grayish brown.	do	6–12	Light yellowish red or yellowish brown.	do	Sandy clay	6.0–4.5
	36–180	Pale brown to light brownish gray.	do	6–12	Light yellowish brown or yellowish brown.	Friable to firm	Sandy clay loam to sandy clay.	6.0–4.5
	36–180	Pale brown to light gray.	do	6–12	Pale brown to pale yellow, some mottling.	Friable	Sandy clay	6.0–4.5
	48–180	Very light gray.	do	6–10	Mottled gray and yellow.	Firm to very firm.	Silty clay to clay.	5.4–4.8
SOILS OF FIRST BOTTOMS								
	60+	Brown or dark grayish brown.	Friable	7–12	Dark yellowish brown.	Moderately firm.	Silty clay loam.	6.8–6.0
	60+	Grayish brown or pale brown.	do	8–10	Very dark grayish brown.	Very firm	do	7.2–6.5

7.2–6.8

7.2–5.0

7.2–6.5

7.2–6.5

7.2–6.5

5.0–4.5

5.0–4.5

5.0–4.5

In addition to the 47 soil series listed in table 5, several miscellaneous land types are mapped: Hilly stony land (Muskingum soil material), Limestone rockland (hilly), Limestone rockland (rough), Rolling stony land (Colbert soil material), Rolling stony land (Muskingum soil material), Rough gullied land (Dewey, Cumberland, and Colbert

TABLE 6.—*Acreage and proportionate extent of the soils*

TABLE 6.—*Acreage and proportionate extent of the soils mapped in Jackson County, Ala.*—Continued

Soil	Acres	Percent
Etowah silty clay loam—Continued		
Eroded undulating phase	1, 197	0. 2
Severely eroded rolling phase	513	. 1
Fullerton cherty silt loam:		
Eroded hilly phase	3, 583	. 5
Eroded rolling phase	5, 808	. 8
Eroded steep phase	1, 377	. 2
Eroded undulating phase	1, 138	. 2
Hilly phase	2, 237	. 3
Rolling phase	2, 130	. 3
Steep phase	3, 013	. 4
Undulating phase	1, 038	. 2
Fullerton cherty silty clay loam:		
Eroded hilly phase	273	(1)
Severely eroded hilly phase	196	(1)
Hermitage silty clay loam:		
Eroded rolling phase	178	(1)
Eroded undulating phase	288	(1)
Hilly stony land (Muskingum soil material)	3, 059	0. 4
Hollywood silty clay:		
Level phase	2, 104	. 3
Undulating phase	1, 300	. 2
Holston loam:		
Level phase	1, 787	. 3
Undulating phase	3, 246	. 5

TABLE 6.—*Acreage and proportionate extent of the soils mapped in Jackson County, Ala.*—Continued

Soil	Acres	Percent
Pope fine sandy loam	190	(1)
Pottsville loam:		
Eroded hilly phase	338	0. 1
Hilly phase	609	. 1
Prader very fine sandy loam	2, 254	. 3
Robertsville silt loam	4, 726	. 7
Rolling stony land:		
Colbert soil material	8, 462	1. 2
Muskingum soil material	7, 792	1. 1
Rough gullied land:		
Dewey, Cumberland, and Colbert soil materials	1, 346	. 2
Muskingum soil material	94	(1)
Rough stony land (Muskingum soil material)	88, 911	12. 8
Sequatchie fine sandy loam:		
Level phase	1, 268	. 2
Undulating phase	4, 802	. 7
Stony alluvium (Muskingum and Colbert		
Taft silt loam	1, 346	0. 2
Talbott silt loam, undulating phase	859	. 1
Talbott silty clay loam:		
Eroded rolling phase	724	. 1
Eroded undulating phase	2, 506	. 4
Severely eroded rolling phase	745	. 1
Tellico clay loam:		
Eroded rolling phase	293	(1)
Severely eroded rolling phase	150	(1)
Tupelo silt loam:		
Level phase	4, 806	. 7
Undulating phase	2, 995	. 4
Tyler very fine sandy loam	3, 133	. 5
Waynesboro fine sandy loam:		
Eroded hilly phase	119	(1)
Eroded rolling phase	1, 102	. 2
Eroded undulating phase	433	. 1
Rolling phase	153	(1)
Undulating phase	434	. 1

Profile description:

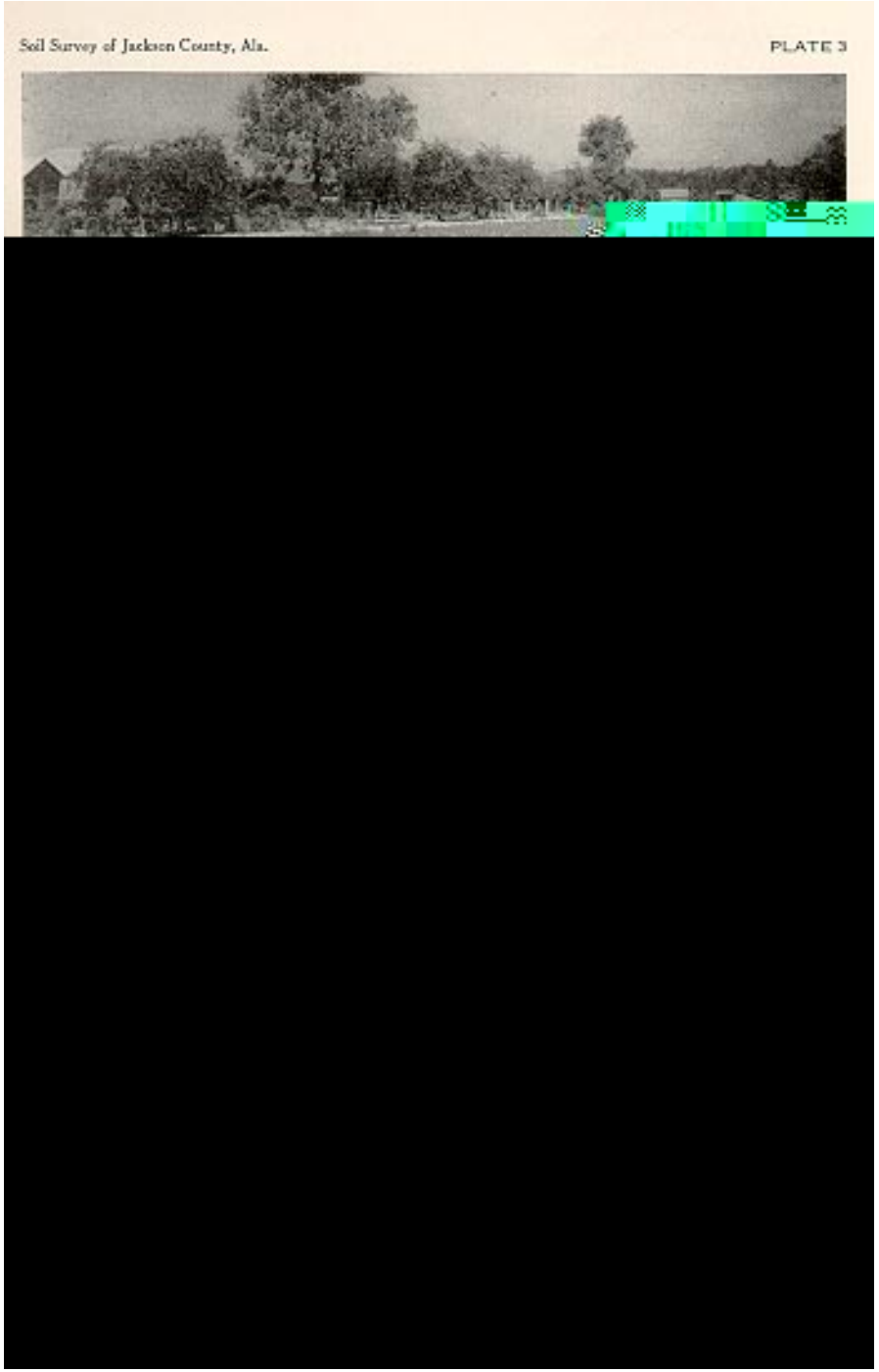
0 to 8 inches, brown to reddish-brown friable silt loam to moderately friable silty clay loam; readily crushed to soft rounded crumbs at favorable moisture content; somewhat sticky and plastic when wet; relatively high in well-incorporated organic matter; slightly to medium acid.

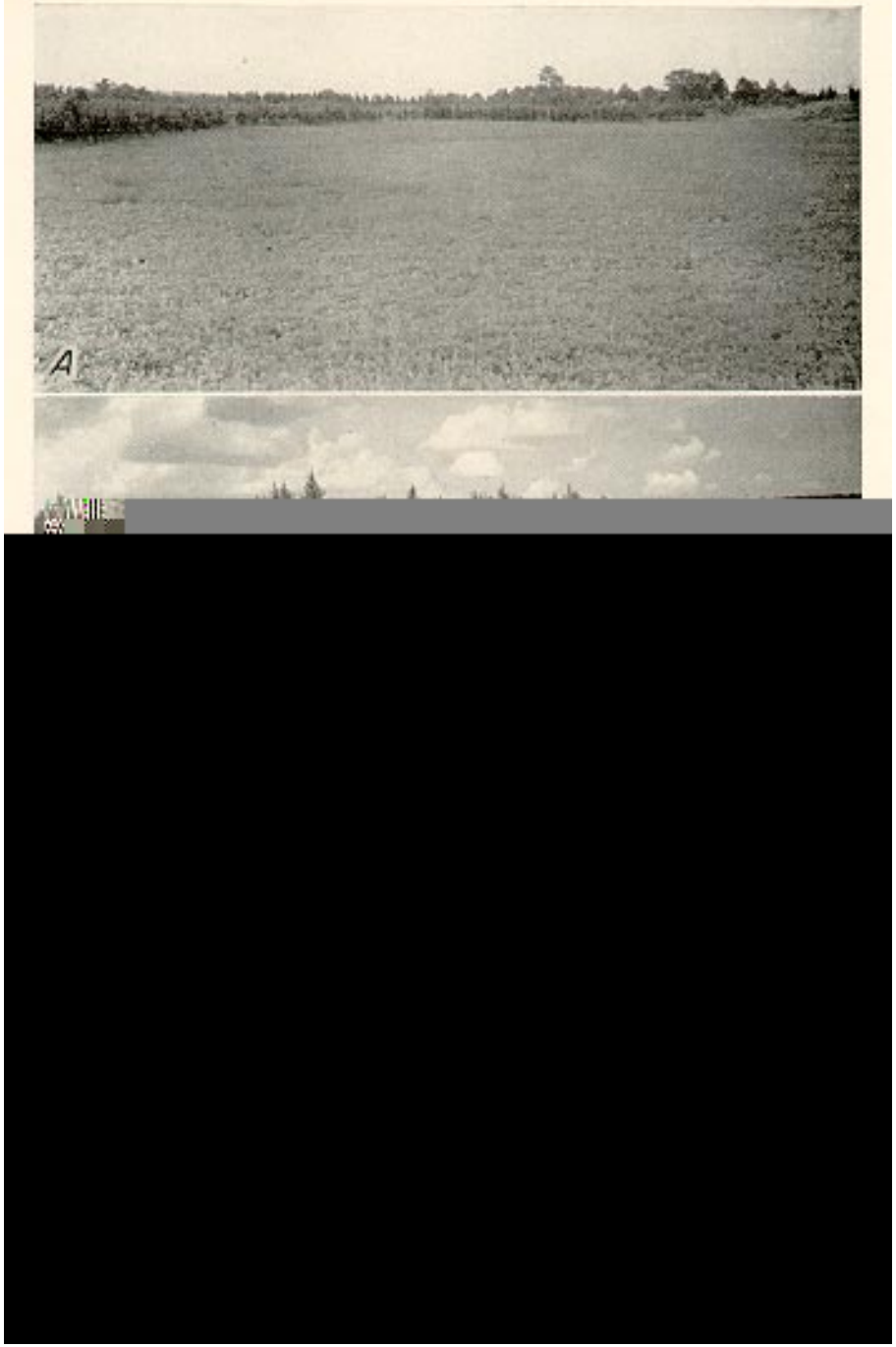
8 to 18 inches, dark-brown to reddish-brown or dark brownish-red friable silty clay loam; slightly redder and lower in organic content than surface layer; medium to slightly acid.

18 to 30 inches, brown to reddish-brown heavy silty clay loam faintly mottled with gray and rust brown, grading with depth to more mottled silty clay.

30 to 36 inches +, yellowish-brown heavy plastic silty clay mottled with gray, reddish brown, and yellowish brown; moderately friable under optimum moisture content; medium to strongly acid.

The texture ranges from heavy very fine sandy loam to silty clay loam. Several areas east and northeast of Hollywood have a heavy silty clay





Profile description:

0 to 8 inches, grayish-brown to weak reddish-brown heavy very friable silt loam; contains considerable organic matter; crushes to soft fine crumbs; medium acid.

8 to 18 inches, dark reddish-brown heavy silt loam or friable silty clay loam; crushes to a powdery mass when dry; strongly to medium acid.

18 to 26 inches, brownish-red friable heavy silt loam to silty clay loam; somewhat brighter red and more compact in places than the layer above but breaks readily to soft crumbs when disturbed; moderately sticky and plastic when wet; strongly acid.

26 to 36 inches, yellow to reddish- or brownish-yellow friable silty clay loam to silty clay mottled with brown, yellow, red, and gray.

The depth of the profile depends on the depth of the recently accumulated soil material. The organic content is relatively high throughout the recently deposited material. In most areas the color remains fairly uniform in the upper layers.

Use and management.—Abernathy silt loam, undulating phase, is practically all under cultivation. It is better suited than the level phase to a wide variety of crops. The crops are never lost because of flooding. The soil has good workability and moisture-absorption and moisture-holding qualities and it is productive. In general the organic content is ample to give mellow consistence and good tilth.

Corn, the dominant crop, usually yields 40 to 60 bushels an acre

clays, the resulting soil is spotted and varies from loamy sand to fine sandy clay loam, even in the same area.

Profile description:

0 to 8 inches, grayish-brown to reddish-brown very friable fine sandy loam;

The layers of the profile vary somewhat. In many places the subsoil reaches a depth of 72 to 96 inches and is underlain by yellowish-brown or brownish-yellow soil material.

Use and management.—Allen fine sandy loam, undulating phase, may be worked under a wide range of moisture conditions. It has good moisture-absorbing qualities, except where erosion has removed a considerable part of the original surface soil. In general, however, erosion has not been serious, and less than half the virgin surface soil has been lost. Small sheet-eroded or gullied areas, in which erosion is common, are designated on the soil map by symbol. Rock fragments on the surface and in the soil generally do not interfere greatly with cultivation, although in places they may hinder tillage.

Although most areas are small, this soil is desirable for general farming, including home gardens and home orchards. Most of it is cultivated, usually to cotton, corn, cowpeas, soybeans, and lespedeza. It is well suited to cotton and where well managed produces ⅔ to 1 bale or more an acre. The soil is suited to winter legumes for green manure. It is very responsive to good management, which includes measures for controlling erosion where necessary, fairly heavy applications of fertilizer, and the use of winter legumes in the rotation. It gives fair to very satisfactory returns when planted to corn, and where limed should prove satisfactory for alfalfa.

Allen fine sandy loam, eroded undulating phase (2–5% slopes) (ADE).—This phase consists of areas of the undulating phase that have lost half to nearly all the original surface soil through accelerated erosion. The soil to plow depth consists of a mixture of surface soil and subsoil. It is reddish brown and comparatively heavy, has become somewhat difficult to till, and has lost some of its water-absorbing capacity. In small severely eroded areas it is chiefly reddish-brown or brownish-red friable fine sandy clay loam subsoil material to plow depth.

Use and management.—Most of Allen fine sandy loam, eroded undulating phase, is used for crops although it is somewhat less desirable than the undulating phase. It responds well to good management, is good for general farm use, and is well suited to cotton, oats, and lespedeza and other hay. In its eroded condition it is less well suited to corn than the undulating phase. It will produce fair yields when corn follows winter legumes, especially if erosion has been checked.

Allen fine sandy loam, rolling phase (5–12% slopes) (ADO).—This phase is similar to the undulating phase in color, texture, structure, and consistence but differs in having steeper slopes. It occurs in small scattered areas associated with other Allen soils, Jefferson soils, and soils of first bottoms.

Use and management.—About half of Allen fine sandy loam, rolling phase, is in forest and permanent pasture; the rest is used largely for general farm crops. It is used for about the same crops as the undulating phase, but crop yields are 10 to 50 percent less. It is best suited to close-growing crops. If clean-cultivated crops are grown, the soil should be protected by terracing and by planting the row-cultivated crops on the contour. The soil erodes readily when cul-

tivated, so one of the main management requirements is erosion control.

Allen fine sandy loam, eroded rolling phase (5–12% slopes) (ADN).—In practically all parts of the limestone valleys this soil occurs in association with other phases of the Allen series and with the Jefferson, Waynesboro, Dewey, and Cumberland soils. Most areas are in the upper part of small valleys and coves, but a few are on benches below rough stony slopes, generally somewhat below the level of the sandstone formations.

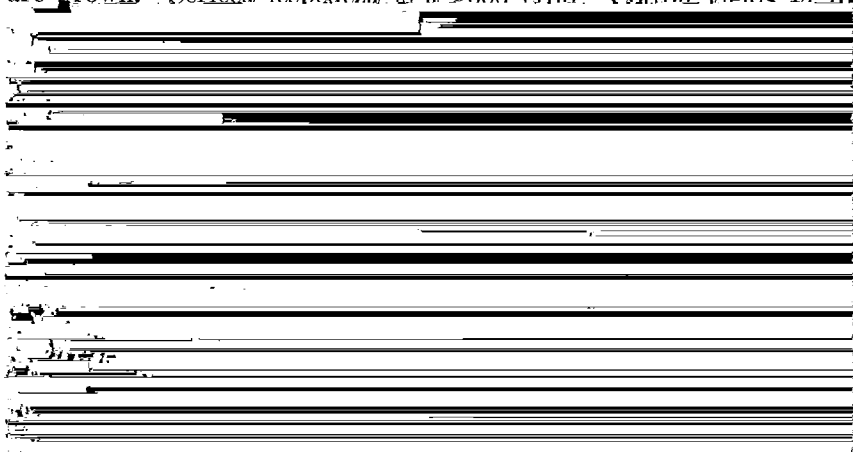
The soil is similar to the rolling phase in position and in slope range but differs in the quantity of surface material lost through erosion. It is also similar to Waynesboro fine sandy loam, eroded rolling phase, in slope, color, and texture but is derived from colluvial rather than alluvial material.

Approximately 70 percent of the original surface soil has been lost through accelerated erosion, although the loss may vary from 50 to nearly 100 percent. Small areas of severely eroded soil are designated on the soil map by symbol.

To plow depth the phase consists of mixed surface soil and subsoil materials. This mixture is slightly reddish gray to reddish brown and has a friable fine sandy loam to fine sandy clay loam texture. The subsoil is essentially the same as that of the undulating phase.

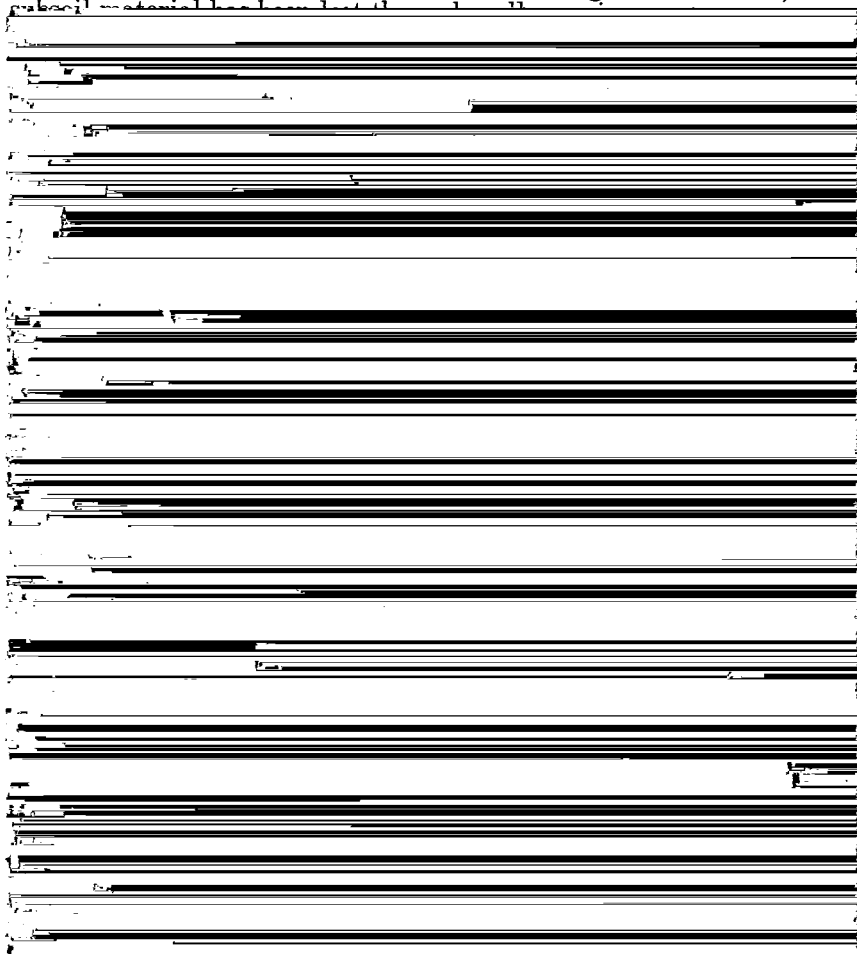
Use and management.—Allen fine sandy loam, eroded rolling phase, is in general well suited to crops requiring tillage, although its stronger slope makes it somewhat less desirable than the undulating phase. The slower moisture-absorption and the lower moisture-holding capacity of the surface soil and subsoil increase runoff, especially during heavy showers or prolonged heavy rains, and consequently the erosion hazard is greater. Permeability to moisture and root penetration in the subsoil are practically the same as for the undulating phase.

All of this phase has been cultivated. About 65 percent is now cultivated, and of this approximately 30 percent is in permanent pasture. About 5 percent has returned to forest vegetation. Cotton is the main crop, but corn, cowpeas, soybeans, lespedeza, and sorghum are grown. Sericea lespedeza is a good crop. Cotton yields ½ to



cleared and used for pasture or crops, but its susceptibility to erosion and the nature of its slopes make tillage operations and erosion control practices difficult. Small scattered areas, however, may be tilled for 1 or 2 years every 5 to 10 years if properly managed. At present the phase is largely in pasture. Some areas are abandoned fields, and others have reverted to forest vegetation. Probably no native or introduced crops are better suited than sericea lespedeza or kudzu for forage on steeply sloping, eroded, and severely eroded soils.

Allen loam, severely eroded rolling phase (5–12% slopes) (ALD).—Small areas of this phase are distributed over the foothills bordering valleys and coves. Slope, texture, color, and other physical characteristics were once the same as for Allen fine sandy loam, rolling phase, but the soil now differs from that phase and from Allen fine sandy loam, eroded rolling phase, in degree of erosion. Practically all of the original surface soil and subsurface soil has been removed by sheet erosion, and the soil to plow depth consists almost entirely of subsoil material. In addition to losses through sheet erosion, some



cultivated crops. Its most feasible use is forest or pasture consisting of either annual or sericea lespedeza.

Armuchee silty clay loam, eroded steep phase (25%+slopes) (AHF).—This phase occurs mainly on the steeply sloping red hills that border the Tennessee River. It is closely associated with the Tellico soils, which are reddish colored and derived from the same shale formation. It also is closely associated with Fullerton and Clarksville on the higher slopes and with Dewey, Talbott, Cumberland, and Etowah soils and rough gullied lands on lower slopes.

Profile description:

0 to 6 inches, yellowish-brown to weak-orange heavy silty clay loam, faintly mottled with pale grayish yellow, light reddish brown, and dark brown;

returned to forest vegetation, largely by voluntary reseeding. A small acreage is cropped. Where erosion is not too active, lespedeza and grasses are established soon after the cultivation of regular field crops is discontinued. Other vegetation, as black locust, pines, sassafras, persimmon, and briers, also make rapid growth on abandoned cropland. Mainly because the soils are highly susceptible to erosion and the slopes are generally too steep for controlling soil losses, little or no attempt is made to establish improved permanent pasture under present economic conditions.

Cotton is the most common crop, and corn, lespedeza, and cowpeas are grown to some extent. Yields of cotton range from ¼ to ⅛ bale

fertility is medium to low. The texture of the surface layer in places is very fine sandy loam or loam. These finer textured areas are associated generally with interbedded sandstone and shale parent rocks.

Use and management.—About 20 percent of Barbourville-Cotaco fine sandy loams, chiefly in the lower less well-drained parts, is in for-

for crops. Most of the areas are in permanent pasture and are not productive even for this use, except early in spring or in wet seasons. Some of the larger areas in which the soil is uniformly loamy fine sand are used for corn, potatoes, melons, and soybeans. The yields, however, vary from fairly good to low.

Capshaw silt loam, undulating phase (2–5% slopes) (CPU).—This phase occurs as small irregular areas on gently sloping to undulating moderately low terraces in the limestone creek valleys and coves. It is closely associated with Etowah silt loam, undulating phase, which it somewhat resembles, but it is less red and less well drained in the deeper layers. It is also associated with the better drained Sequatchie soils and with the more poorly drained Tupelo, Taft, and Robertsville soils. In places it borders upland soils of the Colbert, Talbott, or Fullerton series or alluvial soils of the Lindside or Melvin series. The terraces where it occurs are lower than those of Etowah soils and somewhat higher than those of Tupelo, and the slopes frequently form a complex pattern. External and internal drainage in the upper part of the profile are usually good. Drainage may be somewhat impeded in places by the heavy subsoil. The native vegetation was largely deciduous hardwoods, but some pines occur. Old-field pines are fairly common on cut-over areas.

Profile description:

0 to 8 inches, pale brownish-gray to grayish-yellow friable silt loam; dark grayish brown in the upper 2 to 3 inches caused by organic matter; strongly acid.

8 to 12 inches, brownish-gray to yellowish-brown friable silty clay loam becoming more yellow or yellowish brown and somewhat finer textured with increasing depth; strongly acid.

12 to 26 inches, yellow to yellowish-brown friable silty clay breaking readily into a soft granular mass when moist; when dry forms fairly hard angular to subangular blocks ½ to ¾ inch in diameter; usually uniform in color; strongly acid.

26 to 36 inches, yellowish-brown to pale-yellow firm to friable silty clay faintly to strongly mottled with shades of brown, yellow, gray, and reddish brown; moderately plastic when wet and fairly hard when dry; weakly developed blocky structure; very strongly acid.

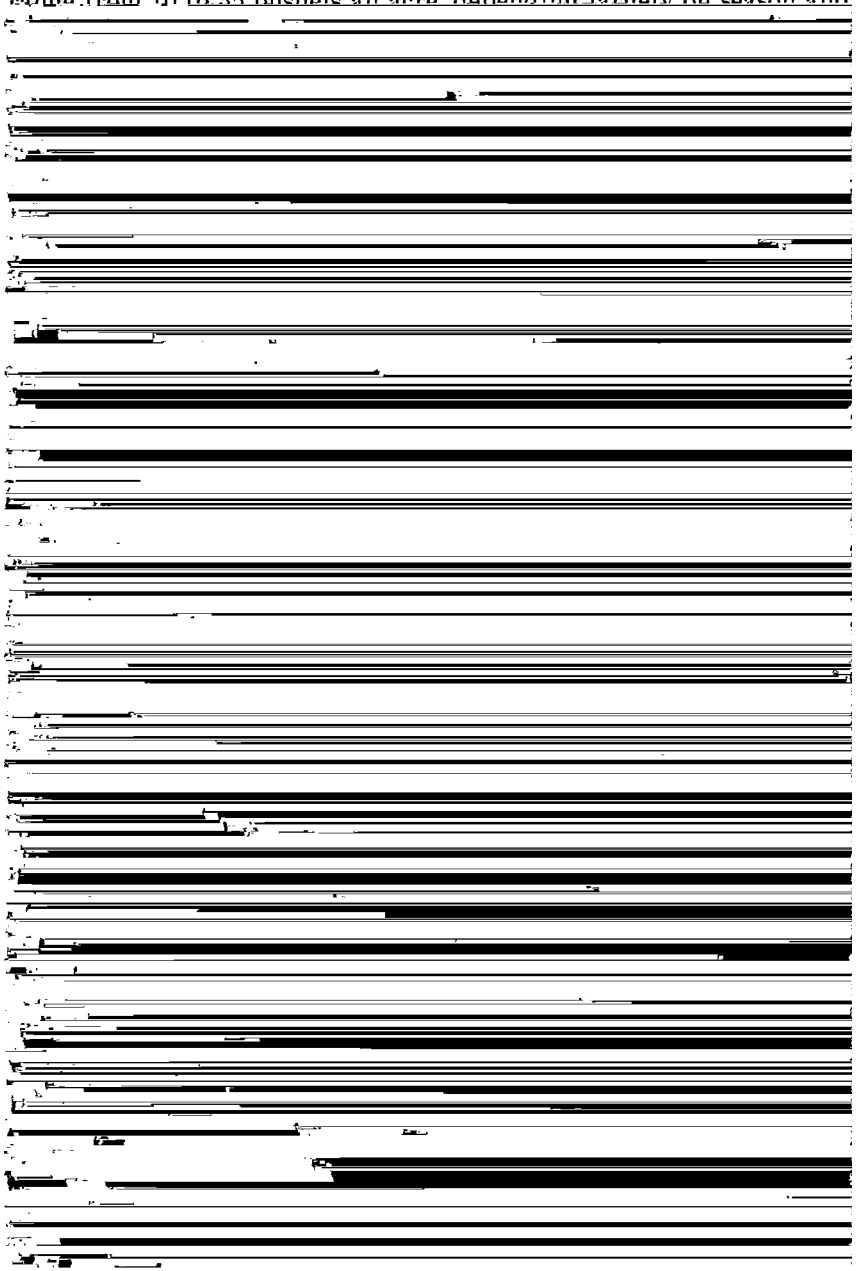
36 to 48 inches, mottled yellow, gray, and reddish-brown firm silty clay to clay.

The chief variations are in the number and distribution of concretions and in color of the surface soil. Dark-brown to nearly black soft, moderately firm, or hard concretions may be in the soil or on the surface. The concretions are most common at or near a depth of 30 inches, but many profiles show no concretions. The surface soil ranges from brown to pale gray.

Use and management.—Because of good tilth, fairly good workability, gentle slopes, good moisture-absorption and moisture-holding capacity, and adequate drainage for most crops, Capshaw silt loam, undulating phase, is a good soil for crop production. Some of the larger areas are adapted to the use of power machinery. In general this soil has many of the favorable features of Etowah silt loam soils, but it is somewhat less well drained and warms up more slowly in spring.

Approximately 80 percent is used for general field crops. Cotton, corn, and hay are the dominant crops. Annual lespedeza and soybeans are the most common hay crops. Yields of cotton, when fertilized with 250 to 600 pounds of 6–8–4 or comparable fertilizer, range

from one-half to nearly a bale an acre. The lower and more nearly level areas are less well suited to cotton than to corn, but in the past most areas have been used for cotton occasionally. When corn follows well-fertilized cotton it is generally side-dressed with 150 to 225 pounds of nitrate of soda or the equivalent in nitrogen fertilizer, but when it follows a winter legume, a side dressing is not used. Yields range from 10 to 35 bushels an acre, depending largely on season and



soybeans. Chert fragments in the plow layer interfere somewhat with cultivation but do not prevent use for cultivated crops. The fragments range mainly from 2 to 8 inches in diameter, but in places they are 18 inches or more in diameter. The larger fragments are often collected and removed from the fields. These fragments, however, aid in warming the soil early in spring, especially for the production of cotton and early truck crops, and in acting as a mulch to absorb and retain moisture in summer.

A common practice is to rotate pasture with row crops. For 2 or 3

ing largely on management and season, cotton yields ¼ to ¾ bale an acre. Corn yields 10 to 18 bushels an acre under common practices and 20 to 35 bushels under better practices.

A small acreage is in forest consisting of red, post, white, chestnut, and blackjack oaks, scaly bark and black hickories, persimmon, beech, redgum, and blackgum. There are a few yellow-poplar and cedar and some old-field pine. The pines are more numerous on cutover or abandoned areas.

The phase is not so productive nor so responsive to good manage-

than 50 percent of the original surface soil. Angular chert fragments 1 inch or more in diameter constitute 20 to 40 percent of the soil mass.

Use and management.—All of Clarksville cherty silt loam, eroded hilly phase, has at some time been cultivated. A small acreage is now used for crops, mainly corn and cotton, but yields are low. On the whole the phase is less desirable for cropping or pasture than the hilly phase. A common practice is to use the land a few years for lespedeza pasture or allow it to lie idle, then to return it to corn, which is frequently followed by cotton. After being in corn or cotton, the land is again pastured or allowed to lie idle. Some areas, however, can be cultivated for a greater number of years than others and can remain idle or in pasture for a fewer number of years between each period of cultivation.

Colbert silty clay loam, undulating phase (2–5% slopes) (CTU).—This phase is well distributed throughout the limestone valleys and coves. It has developed mainly under hardwood forest. It com-

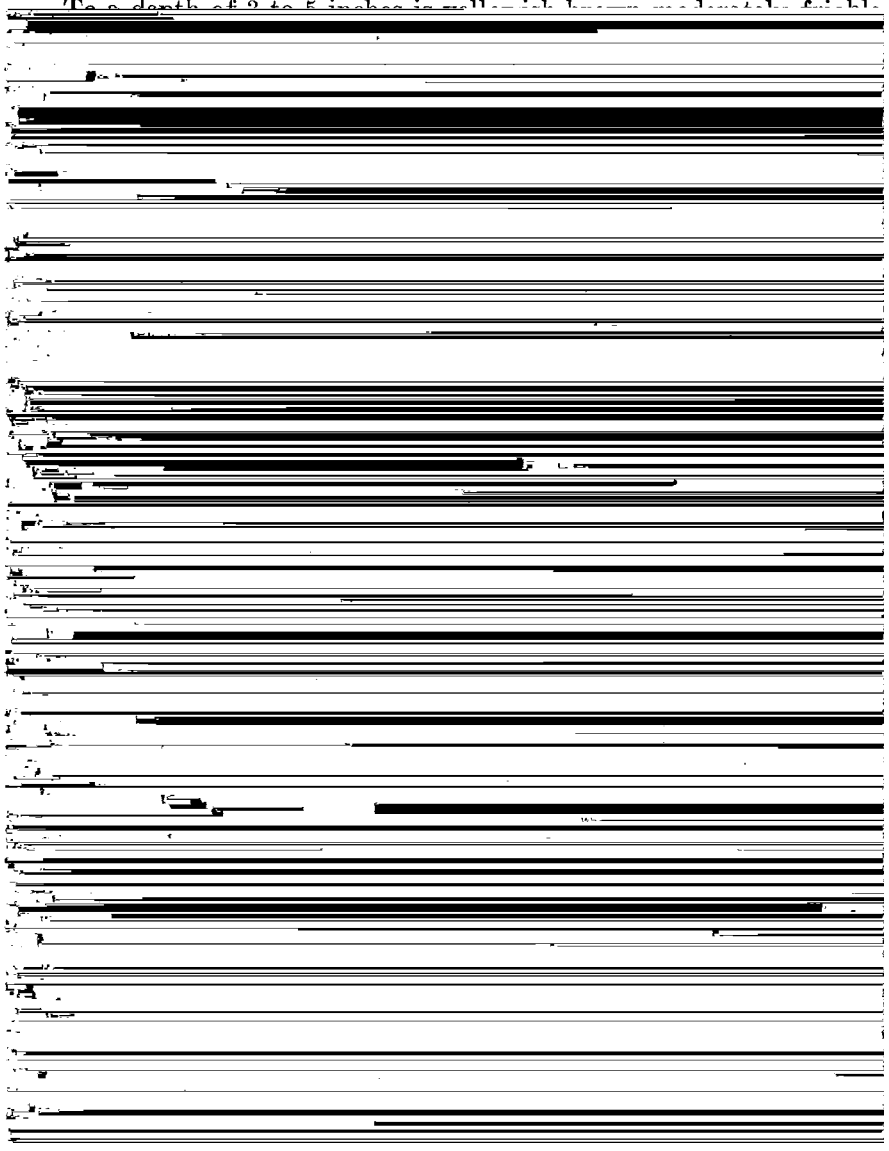
depth to the plastic clay subsoil and its shallow depth to bedrock, it is not well suited to crops. More than 75 percent, however, has been in cultivation at some time, and probably 50 to 60 percent is now being cropped. About 20 percent of the cleared land is in permanent pasture. Some of the forested soil is in woodland pasture. The soil is best suited to hay and pasture. Where the crops are rotated to

depth of 3 to 7 inches the cultivated soil is brownish-yellow to yellowish-brown moderately friable silty clay. The subsoil is yellow heavy sticky mottled clay, very gray in the lower part, that rests on parent material at a depth of 30 to 40 inches.

Use and management.—Colbert silty clay, eroded undulating phase, has fair workability and moisture absorption. It has more rapid surface drainage, is less resistant to drought, and presents a greater problem in conservation than Colbert silty clay loam, undulating phase. Most of the phase is cleared land used for crops and pasture. Cotton, corn, and lespedeza are the principal crops, and the yields normally are 10 to 25 percent lower than those on Colbert silty clay

A small part of the soil is used for cotton, corn, lespedeza, and other general farm crops. Annual lespedeza, hop clover, and Dallis grass—the principal pasture plants—provide fairly good grazing. Sericea lespedeza is well suited; it is an excellent hay crop, forms good pasture, and is helpful in controlling erosion.

Colbert silty clay, severely eroded rolling phase (5–12% slopes) (CBD).—Areas of this phase are scattered over the limestone valleys and coves, principally at the base of steep limestone slopes. The soil differs from the eroded rolling phase in that little or none of the original surface soil remains. The soil to plow depth consists almost wholly of subsoil material.



age is usually good, but internal drainage is fairly slow, especially where seepage water moves through the soil. Although erosion is not generally severe, terracing probably would be helpful where the soil is used for row crops.

Profile description:

0 to 4 inches, dark-brown to grayish-brown friable mellow loam; very strongly acid.
4 to 9 inches, dark-brown to yellowish-brown heavy friable loam to silty clay loam; crushes readily to a soft granular mass under a fairly wide range of moisture content; very strongly acid.
9 to 22 inches, yellowish-brown friable very fine sandy clay to fine sandy clay containing considerable silt; in places more friable with increasing depth and may contain partly weathered sandstone fragments; very strongly acid.
22 inches +, sandstone bedrock.

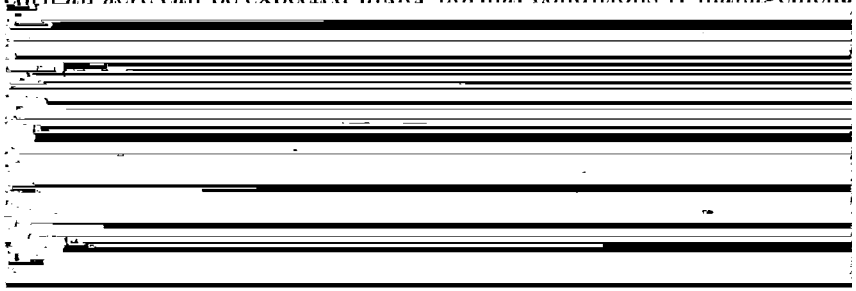
The range in the depth of the soil to bedrock is the principal profile variation. In some places the depth is less than 8 inches, in others more than 30; the usual depth is 12 to 22 inches. In places, however, there are bedrock outcrops. The larger areas include patches of Hartsells soils too small to show separately on the soil map.

Use and management.—Crossville loam is the best soil for pasture on the mountains, and many areas are used for that purpose. Most of the cleared land is used for corn, hay, or pasture. In most places this soil is surrounded by Hartsells soils. In areas where the depth to bedrock is less than 10 inches, the soil is relatively droughty during long dry spells. Most areas are somewhat slow to dry in spring, making this a later soil than the associated Hartsells.

Only about 40 percent of the soil is cleared and cultivated or in pasture. In forested areas the trees are mainly Virginia pine, post oak, sweetgum, blackgum, some old-field pine, and water and southern red oaks. Most of the forested areas are in the northeastern part of the county north of Flat Rock. These areas are still in forest because they are not easily accessible or because their importance for improved pasture is not fully realized.

The areas on the southern part of Sand Mountain are mostly cleared and used for crops and pasture. Lespedeza, Dallis grass, common white clover, orchard grass, and possibly Kentucky bluegrass afford excellent grazing under management that includes yearly fertilization with 500 pounds an acre of basic slag or the equivalent in lime and phosphate.

The suitability of this soil for different crops depends to some extent on its depth to bedrock. The soil in areas where it is 15 inches deep or more over bedrock is well suited to corn. Yields of 15 to 35 bushels of corn an acre can be expected under normal conditions if management



are in other parts of the main limestone valley. The phase is associated most commonly with other Cumberland soils and with Etowah soils. It closely resembles Waynesboro fine sandy loam, undulating phase, although it has a browner and shallower surface soil.

This soil developed from alluvial material washed from soils in the limestone valleys or directly from residuum of weathered limestone with admixtures of material derived from sandstone or from sandy soils. It normally has an undulating to gently sloping surface, but a few included areas have slopes up to 9 percent.

Internal and external drainage are good, except on the stronger slopes where runoff is fairly rapid. The soil is moderately susceptible to erosion, but the erosion can be controlled in most areas by terracing or in places by planting properly selected crops and by plowing along the contour. Natural vegetation consists largely of hardwood trees, shrubs, and vines.

Profile description:

0 to 5 inches, grayish-brown to reddish-brown very friable loam to fine sandy loam; grayish when dry; strongly to medium acid.
5 to 8 inches, grayish-brown to reddish-brown loam, grading to fine sandy clay loam with increasing depth; readily crushed to a friable mass of soft rounded crumbs; strongly to medium acid.
8 to 24 inches, dark-red to dark reddish-brown friable very fine sandy clay loam to silty clay loam; firm in place but crushes easily to a friable mass when broken loose; strongly to medium acid.
24 to 48 inches, dark-red to dark reddish-brown friable silty clay containing some very fine sand; yellowish red or light brownish red and more friable with depth; medium acid.

The depth of the relatively loose friable surface soil and the percentages of sand, fine sand, and very fine sand or silt it contains may vary. A small number of water-worn pieces of gravel are on the surface and throughout the profile in places and a few fine chert fragments or small cobbles occur in others. The thickness of the subsoil ranges from about 40 to 96 inches or more but is generally about 48 to 66 inches.

Use and management.—Cumberland loam, undulating phase, has good workability, good moisture-absorption capacity, and very good moisture-holding capacity. It is easily permeable to roots. It is very desirable farm land and is used in the production of all general farm crops. Cotton and corn are the principal crops. Alfalfa is well suited, but applications of 2 to 3 tons an acre of finely crushed limestone and other good management practices are required for its production.

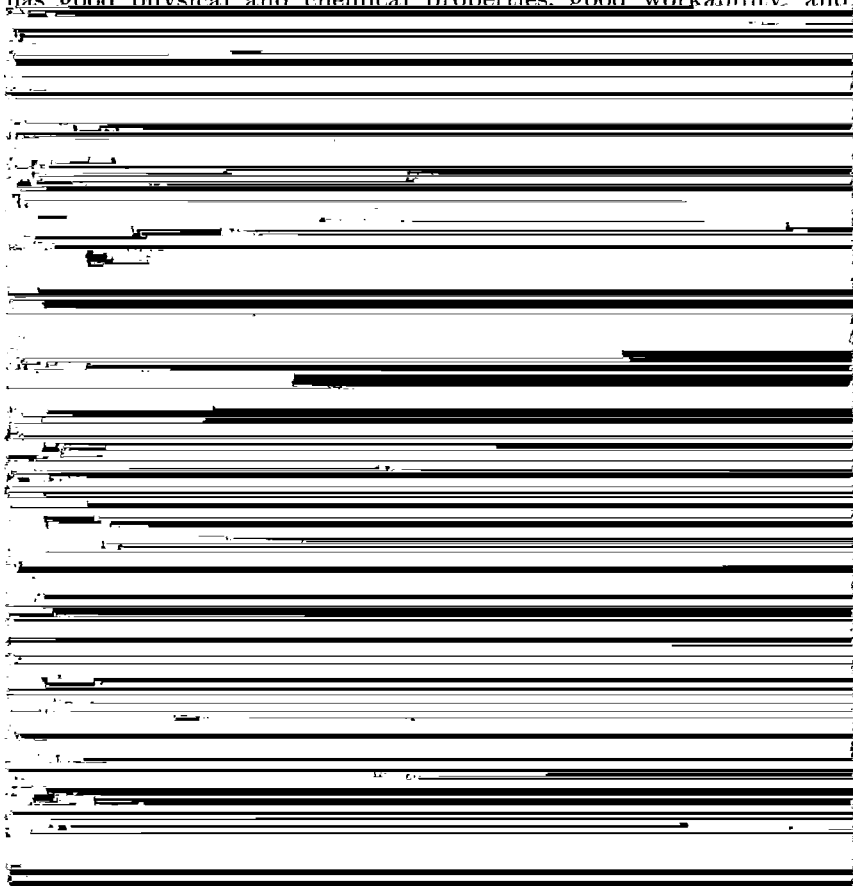
Cumberland silt loam, undulating phase (2–5% slopes) (Csu).—This soil occupies small undulating or gently sloping areas on high stream terraces in the limestone valleys, chiefly in association with other Cumberland soils. Several areas are in the vicinity of Hollywood, near Stevenson, and northwest of Paint Rock. The parent material is largely alluvial in origin and consists of material derived mainly from weathered limestone but to some extent from weathered sandstone and shale. External drainage is good to slightly rapid and internal drainage is good. Erosion is active but has removed less than 50 percent of the original surface soil.

Profile description:

0 to 5 inches, dark grayish-brown to light-brown friable heavy silt loam readily crushed to a mass of soft rounded crumbs when moderately moist and to a loose powdery mass when dry; sticky and subject to puddling when worked too wet but has a fairly wide range of moisture under which it can be worked without puddling; medium acid.
5 to 12 inches, dark grayish-brown friable silty clay loam; grades to reddish-brown moderately friable but firm silty clay with increasing depth; readily crushed to a mellow mass of soft fine crumbs, although the material in the lower part of the layer is heavier and crushes into coarse particles; medium to strongly acid.
12 to 30 inches, brown-red firm but friable heavy silty clay containing some grit consisting of water-worn sand, fine angular fragments of chert, or both; strongly acid.
30 to 48 inches, brownish-red friable heavy silty clay that breaks into somewhat larger and less firm particles than the material in the layer above; in places somewhat purplish red; strongly acid.

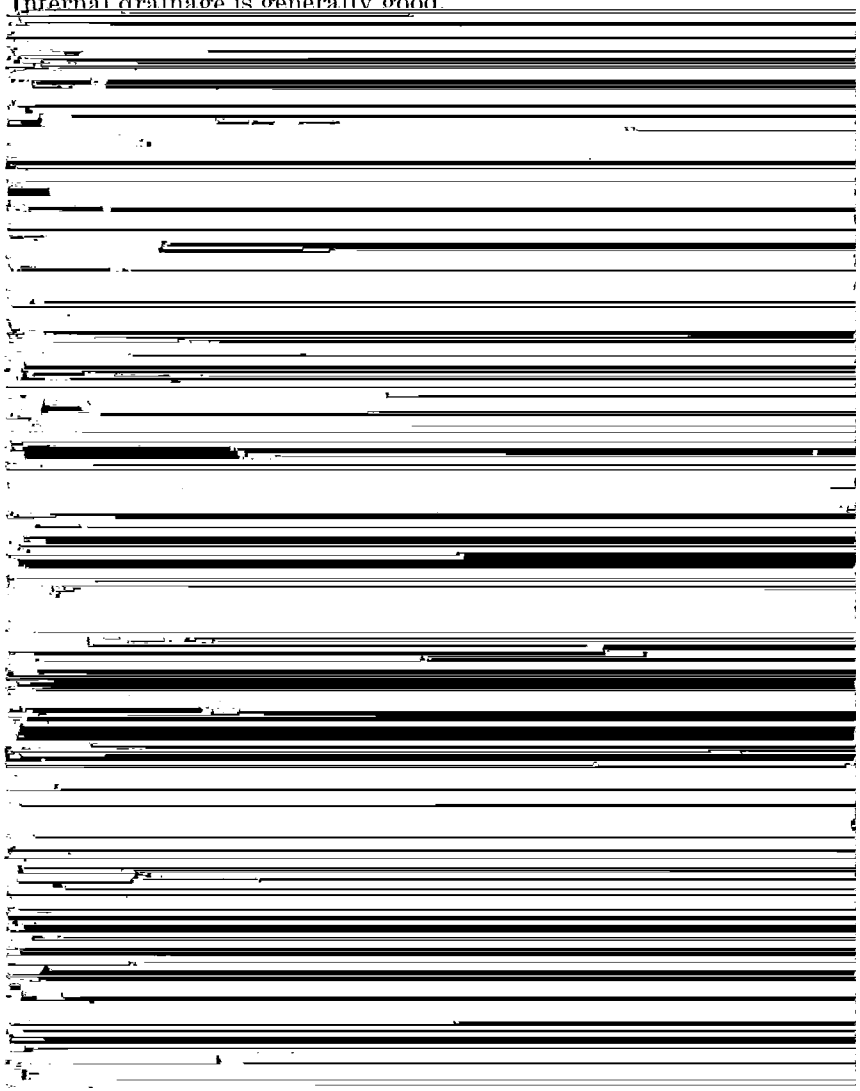
Pebbles and sand are present to some extent in all places, and in some small areas chert fragments may be on the surface and in the soil. Small soft to fairly firm iron concretions are not uncommon throughout the profile.

Use and management.—Cumberland silt loam, undulating phase, has good physical and chemical properties, good workability, and



especially legumes. When treated with 2 to 3 tons of lime an acre, it is well suited to the production of alfalfa, providing other management is good.

Cumberland silty clay loam, eroded undulating phase (2–5% slopes) (CmE).—Although similar to Cumberland silt loam, undulating phase, this phase differs in being eroded to such extent that nearly all the original surface soil is gone. As a result the soil is redder, heavier to plow depth, and consists largely of subsoil material mixed with some surface soil. It occupies well-drained undulating or gently sloping areas in the limestone valleys, where it is closely associated with other phases of Cumberland soils and with soils of the Etowah, Dewey, Waynesboro, and Allen series. External drainage is good but generally somewhat rapid on more strongly sloping areas. Internal drainage is generally good.



main limestone valley on either side of the Tennessee River from the Alabama-Tennessee State line to the Jackson-Marshall County line. The soil has rapid to excessive external drainage, mainly because of its fairly strong slopes, and nearly everywhere has good internal drainage. Erosion has been active, and it is estimated that the areas generally have lost half to nearly all the virgin surface soil. Included with this soil are some areas in which shallow gullies have formed and part of the subsoil has been removed. These gullied areas are indicated on the map by symbol.

The parent material is mainly alluvial in origin, having been brought in and deposited by streams or by local wash. This material is now high above the present streams. Some residual material appears in places, especially southwest and northeast of Bellfonte Island. The soil is relatively free from coarse material, but in places a few pebbles, pieces of water-worn gravel, and small cobbles are on the surface and through the profile. Angular chert fragments are as common as the water-worn material and are numerous in spots, but the quantity of chert, pebbles, or cobbles is seldom, if ever, large enough to interfere with tillage.

Like the other eroded or severely eroded Cumberland soils, this phase is characterized by a reddish-brown surface soil and a brownish-red to red subsoil, the red color nearly everywhere continuing to a depth of 48 to 72 inches. It is separated from the other Cumberland phases mainly on the basis of slope range and percentage of soil material lost through accelerated erosion, and from other red soils like Waynesboro and Allen chiefly on the basis of character of parent material. It resembles the eroded undulating phase in color, texture, structure, and surface and subsoil consistence.

Use and management.—The loss of friable surface soil material through erosion has reduced the moisture-absorption and moisture-holding capacity of Cumberland silty clay loam, eroded rolling phase, and has narrowed the range of moisture content under which it may be worked. Tilth conditions are less favorable, mainly because plowing is done largely in heavy subsoil material.

All this phase has been cultivated at some time. At present one-half to two-thirds is used annually for field crops, and about one-fifth occupies narrow strips of sharply sloping breaks that divide one level from another. These strips have slopes of 9 percent or more and are not cultivated but generally support a fairly dense growth of briers, a few scattered trees, and in places brushland pasture. The rest of the soil is used mainly for pasture or a rotation of pasture and field crops.

The cultivated areas are used largely for cotton and less commonly for corn, hay, and other field crops. Crop yields are relatively low. Cotton yields one-third to about two-thirds bale an acre under fairly good management. When corn follows a winter legume on well-terraced land, yields of 20 to 30 bushels an acre are obtained. The soil is well suited to sericea lespedeza, which makes excellent hay and supplemental grazing. Some of the narrow strips that have strong slopes are well suited to kudzu, either for hay or for grazing.

Erosion control is essential if this soil is to be maintained and improved under cultivation. When properly terraced, the soil can be built up to a fairly high state of productivity by the use of winter cover

crops. Winter legumes are highly satisfactory for soil building, but winter grains can be grown satisfactorily when they follow well-fertilized cotton. No fertilizers are applied at the time of seeding winter grains, but a top dressing of 100 to 250 pounds an acre of sodium nitrate, or the equivalent in nitrogen, applied in spring, probably would be beneficial.

Cumberland silty clay loam, severely eroded rolling phase (5–12% slopes) (CMD).—This is one of the most severely eroded red soils in the county. It is similar to the eroded rolling phase in color, texture, character of parent material, and range of slope and differs from that phase primarily in having lost a greater quantity of surface soil and subsoil material through erosion. This phase is so severely eroded that tillage is almost entirely in subsoil material. External drainage tends to be excessive in most places, but internal drainage is good.

Use and management.—Cumberland silty clay loam, severely eroded rolling phase, has poor workability, slow moisture absorption, and relatively low moisture-holding capacity. Because of the slow moisture absorption, crops will likely be injured more quickly by lack of moisture during dry periods than they would be if grown in less severely eroded or uneroded areas. On the other hand, the soil has good chemical properties and can become fairly productive if it is properly terraced, especially on the more gentle slopes, and organic matter is incorporated by turning under green-manure crops.

All this phase has been cultivated, but because of severe damage from erosion, a large part is idle or in pasture. Probably less than 20 percent is used annually for field crops. Cotton is the principal crop and yields ¼ to ½ bale an acre under common management. Better yields are obtained on areas improved by terracing and other soil-building

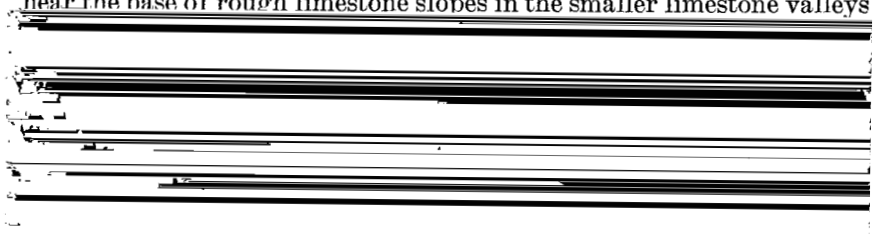
be terraced for close-growing crops, as sericea lespedeza. Kudzu and sericea lespedeza are suitable for controlling erosion. Areas not suitable for close-growing crops and pasture may be allowed to grow up or be planted in forest. Pines are probably the best trees for these localities, and black locust for fence posts may also be grown advantageously.

Cumberland silty clay loam, severely eroded hilly phase (12–35% slopes) (CMR).—This phase is closely associated with the other Cumberland soils and resembles the eroded hilly phase in range of slope and position, although it differs in the amount of surface and subsoil material lost through accelerated erosion. It has a red surface soil and a red to brownish-red subsoil. Practically all the original surface and subsurface soil and much of the upper subsoil have been removed by erosion so that the phase to plow depth now consists mainly of subsoil material. External drainage is very rapid to excessive, but internal drainage is good.

Use and management.—The workability, moisture-absorption capacity, and moisture-holding capacity of Cumberland silty clay loam, severely eroded hilly phase, have been seriously impaired by the loss of friable surface and subsurface soil material. The reduced moisture-absorption capacity of the soil tends to reduce the quantity of soil moisture available for plant use. The phase is difficult to develop into improved permanent pasture but is suitable for sericea lespedeza for use as grazing. Its best use is probably forest. Trees and, where feasible, kudzu or sericea lespedeza are beneficial for checking erosion and building up the soil.

All the phase has been cultivated at some time. As the soil was highly susceptible to erosion, most areas were abandoned in a relatively short time for crop use. Some of them have reverted to volunteer forest of old-field pine, black locust, sweetgum, persimmon, and other common trees; others have been reforested by planting seedlings of pine and black locust. Most of the soil, however, is used for permanent pasture established either by seeding common lespedeza or by allowing common grasses and other plants to reseed themselves. Only a small part is cultivated to cotton, corn, and lespedeza. Low average yields are obtained.

Dewey silt loam, undulating phase (2–5% slopes) (DSU).—This phase occupies comparatively small undulating to very gently rolling or very gently sloping areas on fairly broad ridge tops or small tablelands in the limestone valleys. It is commonly associated with the chert ridges near Bridgeport, northeast of Hollywood, and northeast of Fackler and with the red hills that parallel or border the Tennessee River in irregular and broken chains. Some of the areas adjoin or are near the base of rough limestone slopes in the smaller limestone valleys



areas where there are occasional chert outcrops. This phase is chiefly associated with the surrounding Dewey soils. The gently undulating to undulating relief is favorable to good surface drainage and the texture, structure, and consistence are favorable to good internal drainage.

Profile description:

0 to 5 inches, dark grayish-brown to very dark-brown friable silt loam readily crushed to a mellow mass of fine rounded soft crumbs; acid.

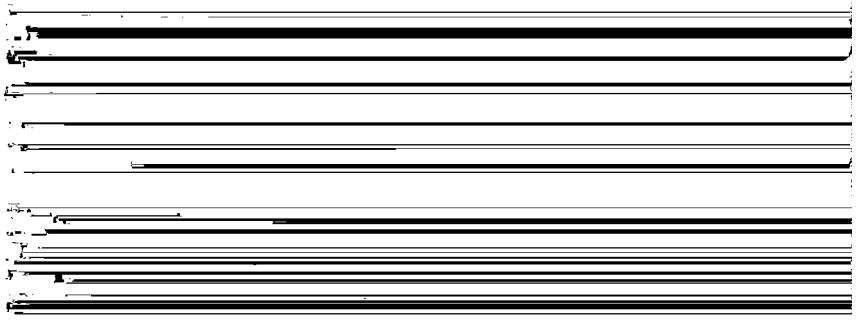
5 to 12 inches, dark reddish-brown firm but friable heavy silt loam to silty clay loam; fairly plastic and somewhat sticky when wet; becomes redder and firmer, lower in organic-matter content, and narrower in range of optimum moisture with depth; larger and more angular soil particles in the lower than upper part of the layer; medium to strongly acid.

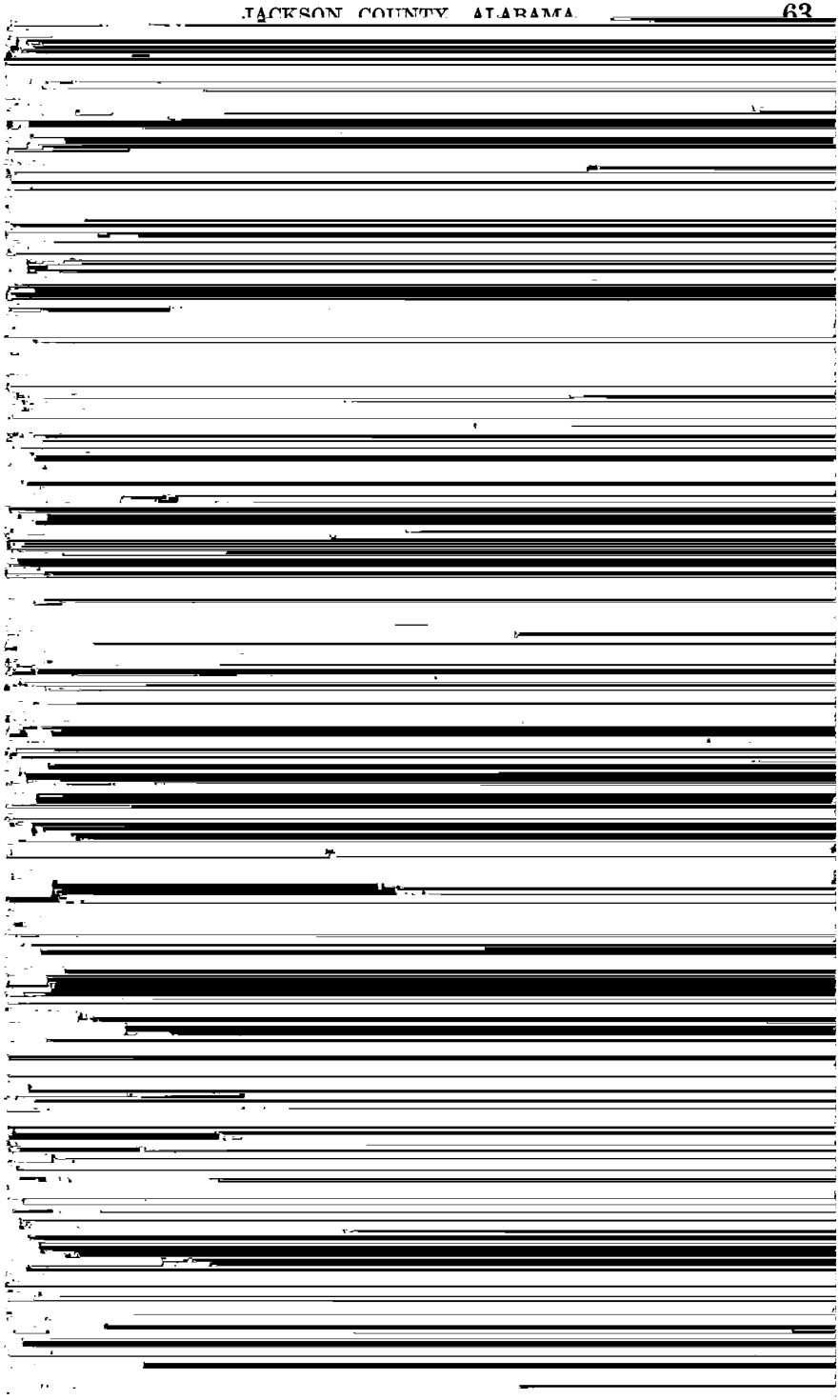
12 to 30 inches, yellowish-red, reddish-brown, to brownish-red firm but moderately friable heavy silty clay loam to silty clay; crumbles readily under slight pressure at optimum moisture conditions into slightly angular fragments that crush easily to a mass of soft crumbs; fairly plastic and sticky when moderately moist to wet, fairly hard when dry; strongly to very strongly acid.

30 to 48 inches, slightly reddish-brown, light-brown, to brownish-red moderately stiff plastic heavy silty clay; breaks into angular or subangular blocks ½ to ¾ inch in diameter; readily crushed to fine moderately soft pieces when in best moisture condition; sticky and plastic when wet, drying into hard lumps not easily broken or crushed by hand; generally firmer and more plastic than the overlying layer and in the lower part more yellow; strongly acid to very strongly acid.

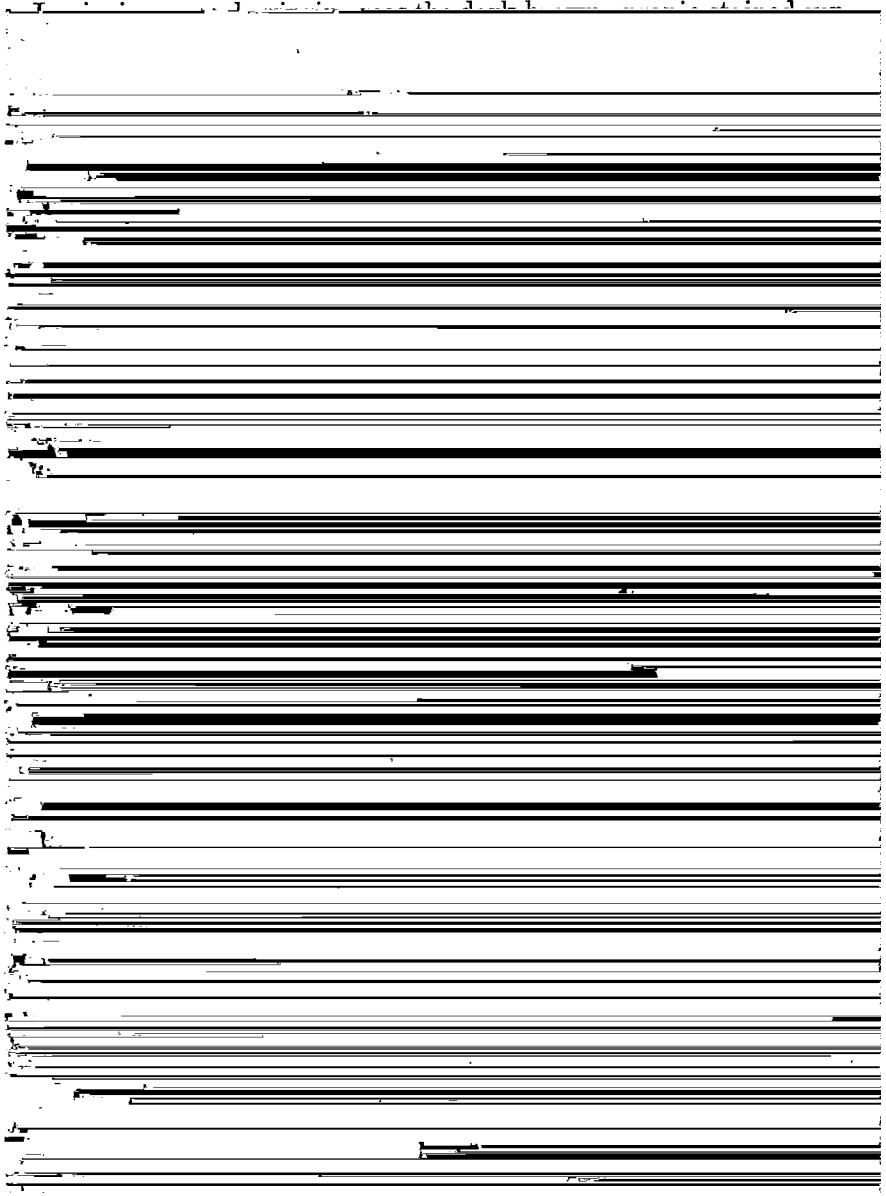
The phase varies in color and surface soil texture. The color ranges from grayish brown to slightly reddish brown. In some places there is an increase in redness in eroded areas, largely because redder soil materials from the subsurface and upper subsoil have been mixed with the remaining surface soil in plowing and cultivating. The redder color may have been brought about partly by the loss of organic matter through continuous tillage and crop production. The variation in texture of the surface soil is partly due to differences in texture of the parent material but more commonly to the loss through erosion of the looser more friable surface soil material and to the admixture of the heavier subsoil material by tillage operations. The greatest variation is in the depth to underlying cherty material.

Small soft iron concretions are generally present and produce a brown-specked or streaked appearance, especially on a cut surface. They usually are more numerous in the subsoil and underlying material than in the surface soil. Some are shotlike and fairly hard. Fine grit and small chert fragments may occur on the surface and in the soil material, but the surface soil is usually free of stone and chert



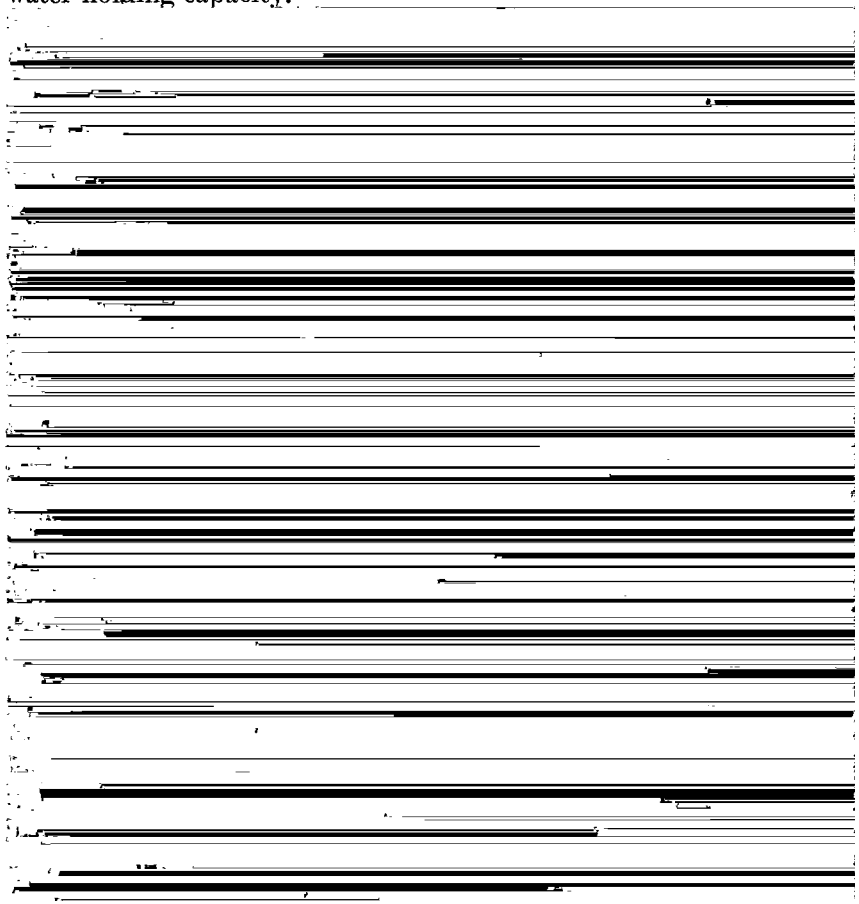


Dewey silt loam, hilly phase (12–25% slopes) (Dsl).—This phase occurs in only a few small areas in close association with the Armuchee-Tellico complexes in the red hills bordering the Tennessee River. Unlike the other hilly phases it is still largely in woodland. The forest has been cut over at various times, however, and erosion has been active in places. In color, texture, and other physical characteristics the phase is similar to the undulating phase, but it generally has thinner surface soil and subsoil layers and many chert fragments.



Cotton, corn, and hay are the chief crops. Cotton yields one-half to more than a bale an acre, depending largely on season and soil management. Corn is not so well suited as to Dewey silt loam, undulating phase; but if a rotation of cotton, winter legumes, and corn is used, fairly good corn yields can be expected. Winter cover crops do well; winter legumes make good cover crops where cotton has been grown. Following summer legumes, oats or rye make good cover crops. Winter oats are well suited and more could be feasibly grown.

Dewey silty clay loam, eroded rolling phase (5–12% slopes) (Dwn).—This is a red soil on uplands in the limestone valleys. It has a brown to reddish-brown surface soil and a yellowish-red to dark brownish-red subsoil, both of which are moderately heavy. External drainage is rapid to excessive, and internal drainage good. Since it has been tilled the phase has lost half to nearly all its original surface soil through erosion, and its remaining surface soil has become so mixed with the subsoil material that it now consists of reddish-brown moderately friable heavy silty clay loam. The loss of the virgin surface soil through erosion has also resulted in reduced organic-matter content, impaired tilth, and lowered water-absorption and water-holding capacity.

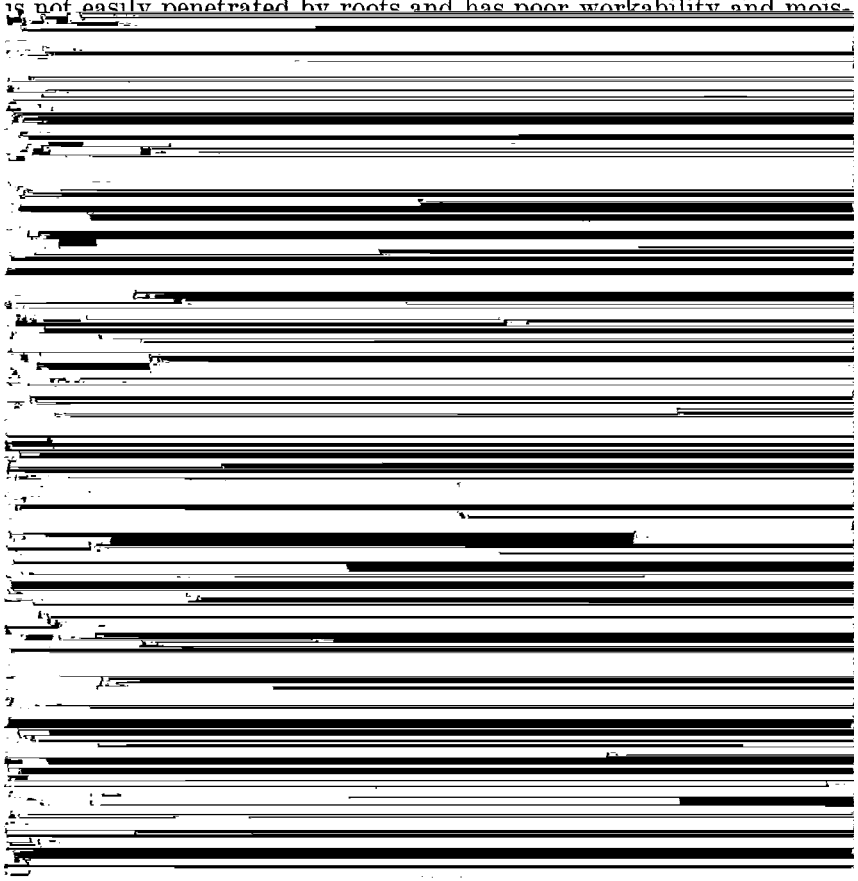


phate or basic slag. In the forested areas volunteer shortleaf pine is most common, although cedar, hickory, persimmon, blackgum, and red gum are fairly common in places.

Dewey silty clay loam, eroded hilly phase (12–25% slopes) (Dwh).—This red moderately heavy soil occurs chiefly in the red hills bordering the Tennessee River. It is closely associated with other Dewey soils, especially other hilly phases, the Armuchee-Tellico complexes, and the Fullerton soils. The parent material is derived from shale and highly cherty limestone. The native vegetation consisted largely of deciduous hardwoods. Old-field pine is fairly common in cut-over areas and in old fields that have reverted to forest vegetation.

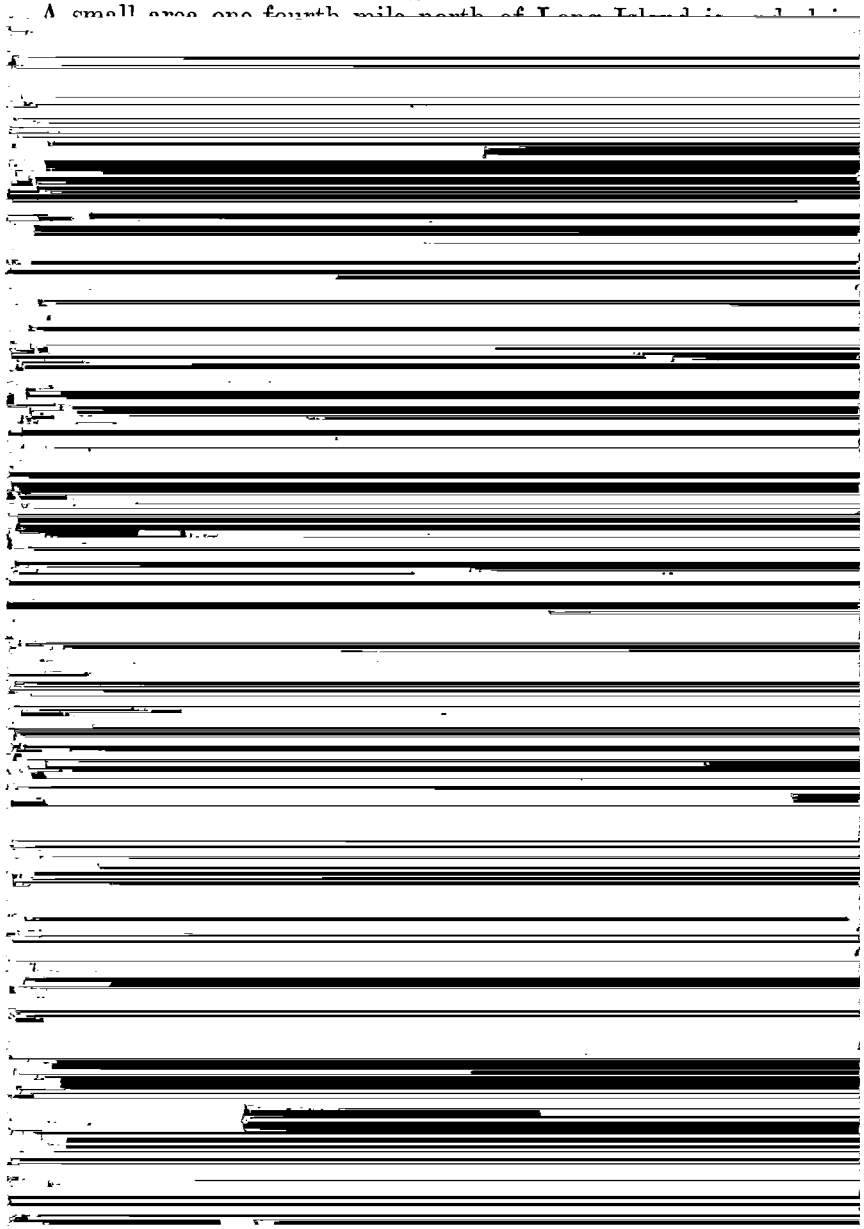
External drainage is very rapid to excessive, and internal drainage good to moderately slow. Erosion has been active and has removed half to three-fourths of the virgin surface soil. The soil to plow depth is largely subsoil material mixed by tillage with what remains of the original surface soil, and as a result of the addition of heavier and more plastic and sticky subsoil material the surface soil now has a heavy silty clay loam texture.

Use and management.—Dewey silty clay loam, eroded hilly phase, is not easily penetrated by roots and has poor workability and mois-



Dewey silt loam and Fullerton cherty silt loam. It has a less cherty surface soil than the cherty soils of the Fullerton and Clarksville series. The thin to 24-inch cherty surface soil is grayish-brown, friable, and moderately eroded. It is underlain by a relatively chert-free red firm but friable silty clay subsoil that ranges from very thin to more than 36 inches thick. The subsoil overlies highly cherty clay soil material that in most places resembles the cherty material under the Fullerton and Clarkville soils.

A small area one fourth mile north of Long Island is [illegible]



been improved. Sericea lespedeza for hay and periodic grazing is considered a good crop for the stronger slopes and more eroded areas.

Dewey chertv silty clay loam, severely eroded rolling phase

Dunning is frequently subjected to long periods of overflow, especially in winter; whereas the Hollywood soil, although subjected to sheet wash carried by runoff water, is seldom flooded by standing water.

Dunning silty clay is relatively lower than the adjoining soils of the first bottoms, except at the drainage outlet. Because of the high water table throughout most of the year, the soil is nearly permanently wet. Runoff is slow, but most areas have natural surface outlets. Internal drainage is very slow.

Profile description:

0 to 3 inches, very dark grayish-brown silty clay faintly mottled with shades of gray, yellow, and brown; breaks into a mass of fine angular granules that dry into firm to hard particles; slightly acid.

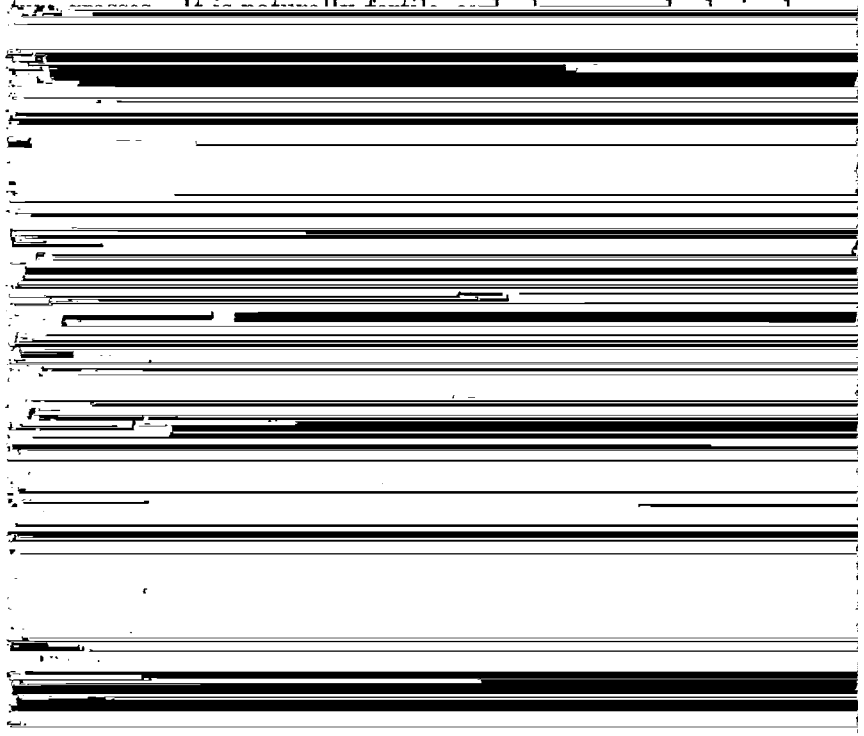
3 to 10 inches, dark grayish-brown heavy stiff clay with a slight olive-drab tinge and faintly mottled or splotched with shades of dark gray and brown; plastic when wet, but breaks into small nutlike fragments when moderately dry; slightly acid.

10 to 26 inches, dark-gray mottled with gray, brown, and yellow heavy stiff clay with an olive tinge; plastic and sticky when wet, but breaks into coarse angular fragments when dry; medium acid to nearly neutral.

26 to 40 inches, grayish-brown to olive-drab heavy stiff clay mottled with shades of gray, yellow, and brown; plastic when wet, but breaks into small angular lumps when dry; slightly acid.

The upper part of the surface layer in a virgin area contains a high percentage of well-incorporated organic matter.

Use and management.—Nearly level relief, fine texture, and a high water table make Dunning silty clay undesirable for field crops because good artificial drainage is fairly difficult to obtain. In most areas, however, the soil can be drained well enough by open ditches for pas-



drainage is adequate for good aeration. In the lower part of the subsoil drainage is slow and aeration poor.

Profile description:

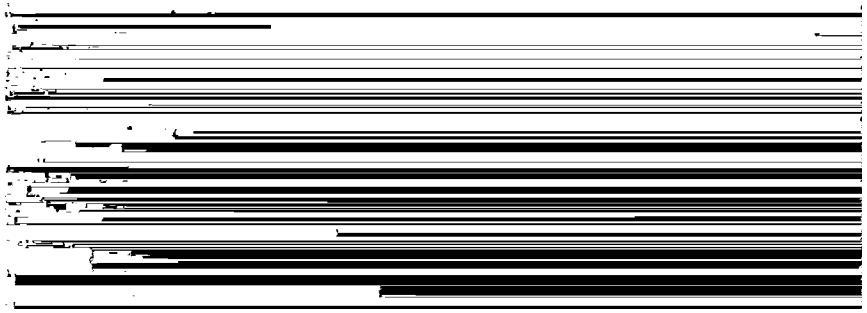
0 to 8 inches, grayish-brown friable heavy silt loam tinged with olive; easily broken into a fairly mellow mass of soft very fine granules; slightly acid.
8 to 12 inches, dark grayish-brown friable silty clay loam; somewhat sticky and plastic when wet; medium to slightly acid.
12 to 30 inches, very dark grayish-brown to nearly black or dusky-olive stiff tight clay; relatively uniform in color but finely specked with brown and yellowish brown; medium acid to nearly neutral.
30 to 48 inches, dark grayish-brown mottled with gray and yellow silty clay; gray mottling more intense with increasing depth; stiffer and tighter consistence than that of the overlying layer.

This soil varies considerably in texture and color from place to place. In general, areas bordering the Tennessee River have more friable and deeper surface soil. The subsoil is dark and compact but generally is not so tough as in the areas along the smaller streams. In many areas in the Paint Rock River valley the surface soil is very shallow, and the subsoil is dark, compact, and tough. South of Estill Fork are several areas in which the surface soil resembles that of Lindside silt loam, and the subsoil, that of Dunning silty clay or of the level and undulating phases of Hollywood silty clay.

In most areas the soil is practically free of gravel, pebbles, and chert fragments. In the upper part of the Paint Rock River valley and in some other valleys where floodwaters are generally rapid, water-worn pieces of gravel and chert fragments may occur both on the surface and in the soil.

Use and management.—Probably 60 percent of Egam silt loam is in cropland used mainly for corn, soybeans, lespedeza hay, and Johnson grass hay. Approximately 30 percent is in permanent pasture, and 10 percent is in native trees, mainly deciduous hardwood, and woodland pasture. Little fertilizer is used for crops. Depending on management, corn yields 20 to 50 bushels an acre; soybean hay, 1½ to 2 tons; and lespedeza hay, 1 to 1½ tons. Some areas are planted to oats, but the hazard of floods in winter limits use of this crop. Spring oats are sometimes grown. Heavy farm machinery can be used on this soil in most of the major valleys and in some of the small valleys and coves.

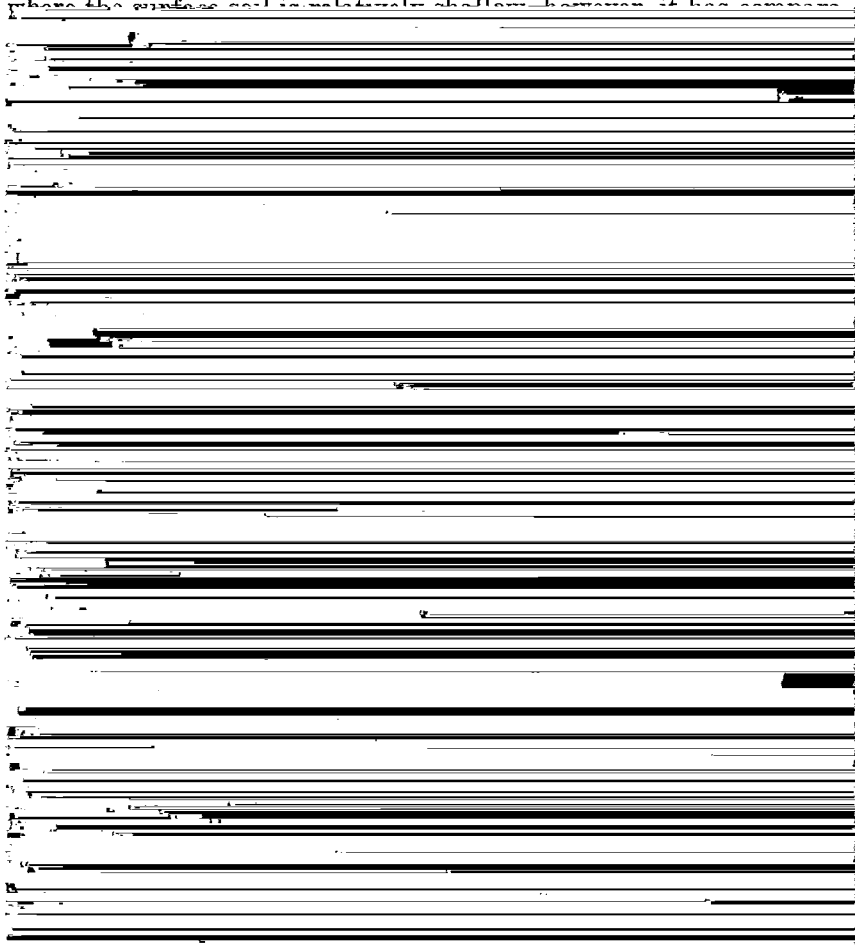
Egam silty clay loam (0–2% slopes) (EL).—This well-drained soil occupies relatively large areas in the first bottoms of limestone valleys along the large creeks and the Tennessee River. It is similar to Egam silt loam in relief, position, character of parent material, soil characteristics, drainage, and native vegetation, but it has a shallower and finer textured surface soil. The slope is generally slightly



silty clay. In general, the surface soil is less deep than in Egam silt loam and in places this layer is in comparison very thin.

In most areas along large creeks and in probably half of those along the Paint Rock River this soil has a friable silty clay loam surface layer 6 inches or more thick. In some areas along the Paint Rock River and in a few areas along some of the larger creeks it has a comparatively thin surface soil averaging less than 6 inches thick and a dark-colored compact tight subsoil. A few of the larger areas of this soil with a relatively shallow surface layer are south of Garth. The soil in several areas north of Paint Rock has a silty clay surface soil 6 to 8 inches thick. The color in these areas is fairly typical, but the soil is slightly less well drained. In these areas it is closely associated with Lindside silty clay and Melvin silty clay but is better drained than either.

Use and management.—Where the surface soil is 6 or more inches deep, Egam silty clay loam has fair to good tilth, is easily worked, and has fair to good moisture-absorption and moisture-holding capacity. It has a wide range of use suitability for crops. In areas where the surface soil is relatively shallow, however, it has compara-

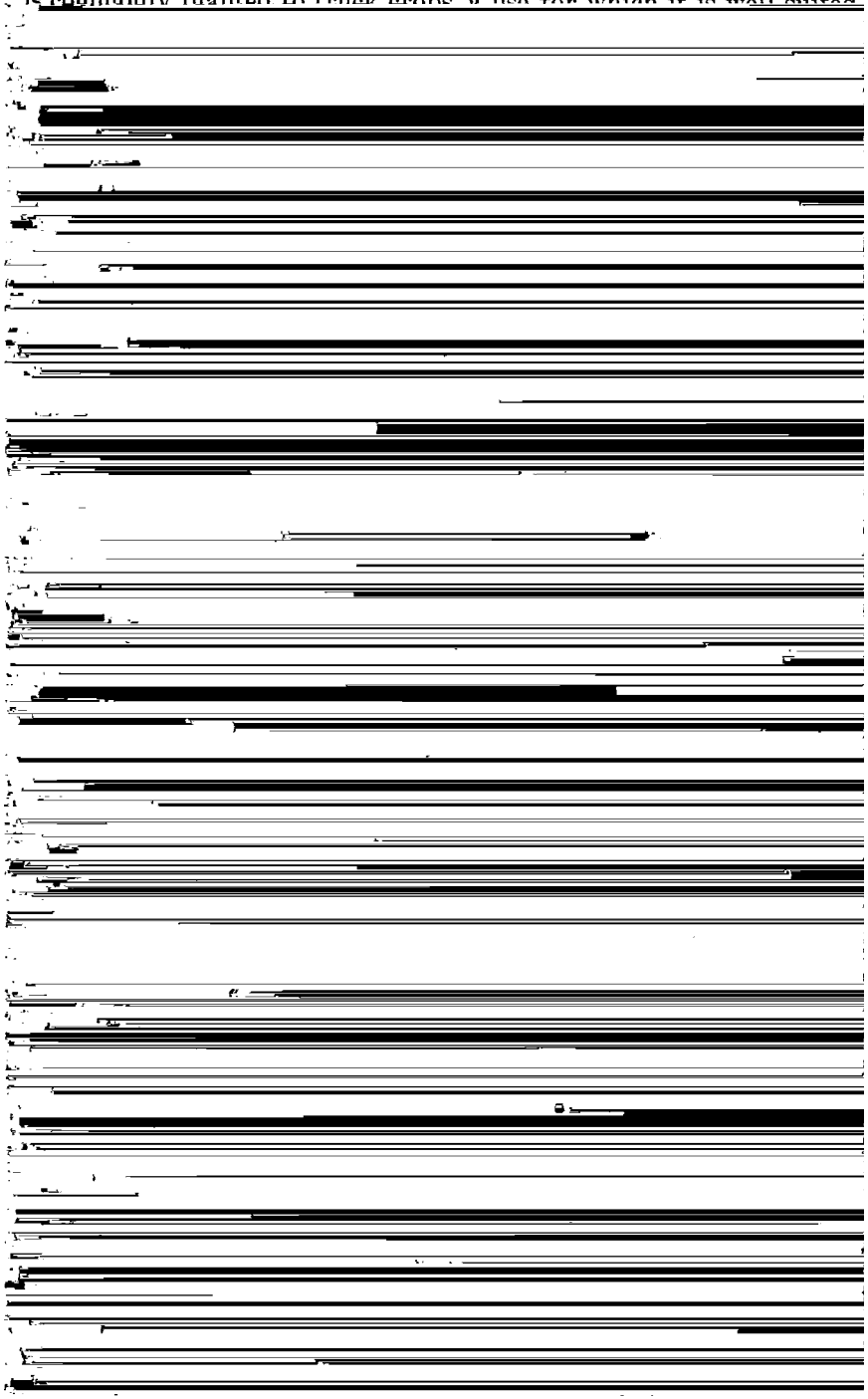


slightly lower elevations the parent material may consist partly of alluvial and colluvial deposits. External drainage is generally good, but in wet seasons it may be somewhat slow in the nearly level areas. Internal drainage is generally good to fair in the surface soil and upper part of the subsoil, but fair to slow in the lower part of the subsoil and slow in the parent material.

Profile description:

½ to 0 inch, fine leafmold.
0 to 3 inches, loose friable silt loam containing enough well-incorporated organic matter to be fairly dark gray; strongly acid; small platy fragments of siltstone present in places.
3 to 9 inches, pale-gray to pale-yellow friable silt loam; grades with increasing depth to moderately friable heavy silt loam; strongly acid.
9 to 12 inches, light grayish-yellow moderately friable heavy silt loam to silty clay loam faintly mottled with brownish yellow; contains some thin fragments of shale and fine-grained sandstone; when moist, moderately firm in place but easily crushed to a friable mass; when wet, somewhat plastic; very strongly acid.
12 to 30 inches, yellow to reddish-yellow firm silty clay; tough and hard when

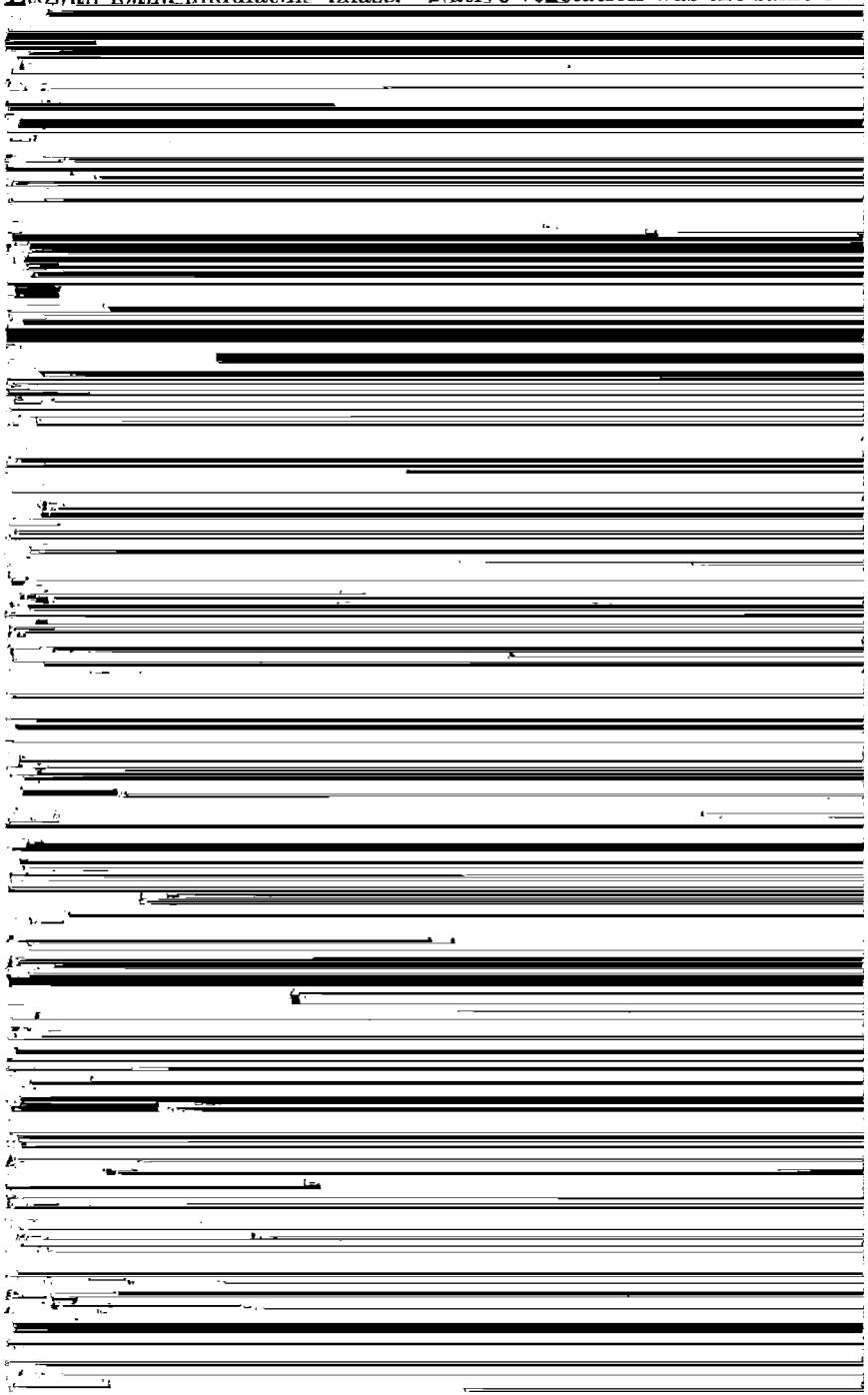
farmed has been put under cultivation in relatively recent years. It is commonly planted to truck crops, a use for which it is well suited



south of Christian Home, where it is in close association with the undulating and eroded undulating phases. It is similar to the undulating phase in profile characteristics but differs in having steeper slopes. Under virgin vegetation external drainage is good, but in most places it becomes somewhat rapid to excessive after the land is cleared and used for cultivation. Internal drainage is good to fair in the surface soil and upper part of the subsoil and fair to slow in the lower part of the subsoil. Little of the moisture absorbed by the soil

Cotton, soybeans, cowpeas, lespedeza, and corn are the main crops. Yields range from 20 to 30 percent lower than on the undulating phase

drainage are slower than for the undulating phases of Etowah loam and Etowah silt loam. The parent material is similar to that of Etowah loam, undulating phase. Native vegetation was the same on



The texture varies from loose friable fine sandy loam to heavy fine sandy clay loam or very fine sandy clay loam. The depth of the surface soil ranges from 3 to 12 inches.

Use and management.—Practically all of Etowah loam, undulating phase, has been cleared, and most of it is in crops. It is one of the most desirable soils in the county for agriculture. Because it occurs as fairly large areas or is closely associated with other good agricultural soils, it offers the farmer an opportunity to plan good land use and farm lay-outs. It is suitable for the operation of large farm machinery and for power farming, has good physical and chemical qualities, and is easy to till under a wide range of moisture conditions. It is well suited to all locally grown crops. Treated with 2 to 3 tons of finely crushed limestone and other needed management practices, it is well suited to alfalfa.

This soil is very responsive to good management and can readily be maintained at a high level of productivity. Erosion is not serious on slopes of less than 3 percent. On slopes of 3 to 5 percent or more, however, erosion control measures must be taken. Terracing probably would be beneficial on the gentler slopes and is necessary where the slope exceeds 5 percent and the land is planted to intertilled crops.

Etowah silt loam, undulating phase (2–5% slopes) (Esu).—This phase occupies undulating and gently sloping areas on stream terraces. The parent material is alluvial, its origin being mainly limestone and to some extent sandstone and shale. External drainage is

lem in the conservation of moisture and material. Under cultivation, however, it is moderately susceptible to erosion. When the soil is continuously cropped and not replenished with plant nutrients, it produces lower yields. Erosion, however, can be controlled by simple conservation practices, and soil fertility can be maintained, or even improved, by the use of proper amendments and other good management.

Practically all this phase is used annually for cotton, corn, soybeans, lespedeza, and other general crops. It is productive and highly responsive to good management. Depending mainly on kind of management, it produces ½ to 1¼ bales of cotton, 20 to 50 bushels of corn, 1 to 1¾ tons of lespedeza hay, and 1 to 2 tons of soybean hay an acre. Cotton is generally fertilized with 300 to 600 pounds of a high-grade fertilizer, as 6–8–4 or 4–10–7. Corn often follows a winter legume plowed under as green manure, or the crop is side-dressed with 100 to 225 pounds of nitrate of soda an acre or the equivalent in nitrogen fertilizer. Other field crops are seldom fertilized. Truck and garden crops, which are grown to some extent, receive heavy applications of mixed fertilizer or barnyard manure.

Etowah silt loam, level phase (0–2% slopes) (Esv).—This phase occurs generally as small widely scattered areas on relatively low, level but well-drained stream terraces in the limestone valleys. It is

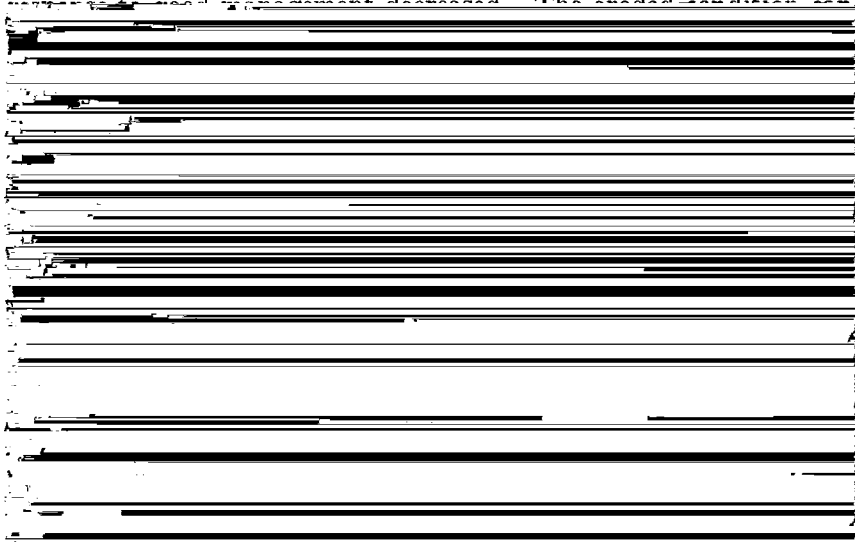
the land is planted annually to general field crops; the rest is in pasture or second-growth trees.

Under common management cotton produces ⅓ to ¾ bale an acre; corn, 20 to 45 bushels; oats, 20 to 45 bushels; soybeans, ½ to 1 ton of hay; and lespedeza, ⅔ to 1½ tons of hay. Volunteer or native pastures consist chiefly of lespedeza, Dallis grass, and Bermuda grass. The improved pastures contain also common white clover and Kentucky bluegrass, and possibly orchard grass and hop clover.

Etowah silty clay loam, eroded undulating phase (2–5% slopes) (Ete).—This phase occupies undulating to gently sloping terrace positions in the limestone valleys, where it is closely associated with other Etowah soils and with Dewey, Talbott, Cumberland, and other well-drained soils. It is similar to Etowah silt loam, undulating phase, in parent material, relief, position, and distribution but has a redder and finer textured surface soil. The two soils were probably identical under virgin conditions. External drainage is more rapid than on the undulating phase of Etowah silt loam, partly because of the generally stronger slopes but largely because of reduced moisture absorption resulting from erosion. Internal drainage is generally good.

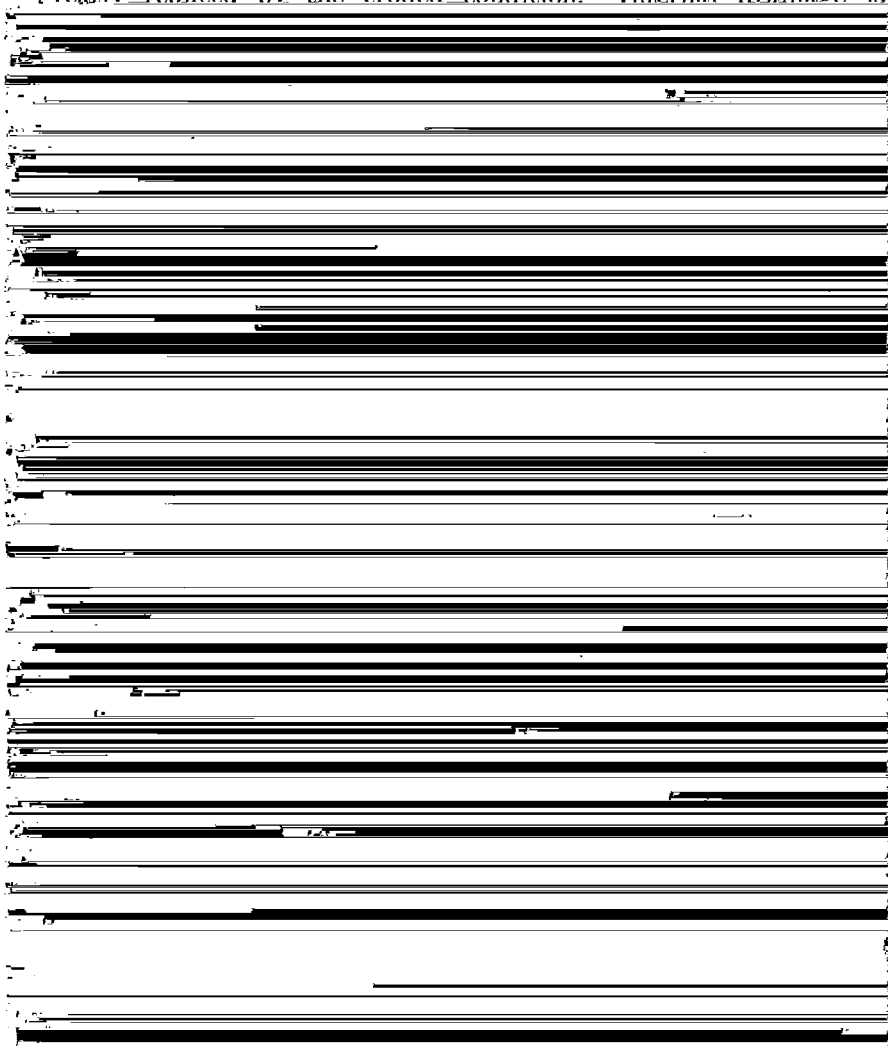
Sheet erosion has removed half to nearly all of the original surface and subsurface soil. In some places not only the surface soil and subsurface soil, but material from the upper part of the subsoil has been lost through shallow gully erosion. The present surface soil therefore consists largely of redder and finer textured subsoil material mixed by tillage with the remaining surface soil and subsurface soil; and it is much shallower, heavier, and less friable than the surface soil in virgin areas. The present surface soil is grayish brown to light reddish brown; the subsoil, yellowish brown to yellowish red.

Use and management.—Tilth conditions, water absorption, and water-holding capacity of Etowah silty clay loam, eroded undulating phase, have been impaired by soil loss through erosion. As a result, problems of conserving moisture and soil have been increased and the



or along ridgelike divides on the terraces. It has grayish-brown to reddish-brown surface soil and yellowish-brown, reddish-brown, or yellowish-red subsoil. The parent material is alluvial and principally of limestone origin. The color and texture of the surface soil are similar to those in the eroded undulating phase; its relief to that of Etowah silt loam, rolling phase.

Susceptible to erosion, especially on the slopes of 8 percent or more, this phase has lost approximately half to three-fourths of its original surface soil and subsurface soil through sheet and shallow gully erosion. Moderately deep gullies are common, with some too deep to be crossed by heavy farm machinery. Some of the gullies are designated on the soil map by symbol. External drainage is rapid to excessive, largely because the slopes are strong, and moisture absorption is greatly reduced by the eroded condition. Internal drainage is

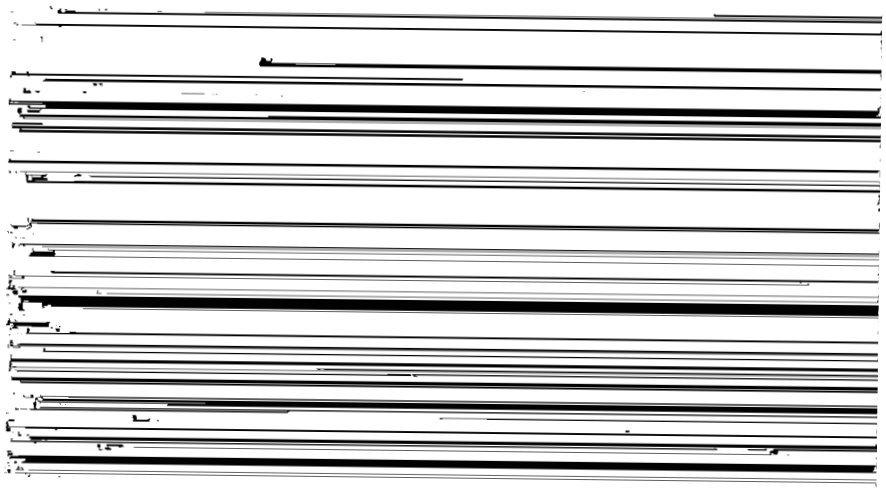


moderately friable silty clay loam, consists largely of subsoil material and is reddish brown or grayish brown with a reddish hue. The subsoil is yellowish red to reddish brown moderately friable silty clay mottled to some degree in the lower part with yellow, brown, and red. Below the subsoil is yellowish brown, mottled with yellow, red, and gray, soil material. The parent material, similar to that of other Etowah soils, is alluvial in origin and is derived largely from limestone material.

Use and management.—At present probably not more than 20 percent of Etowah silty clay loam, severely eroded rolling phase, is used each year for field crops. Most of the phase is in unimproved or idle-field pasture, although a few areas have been allowed to grow over with forest vegetation consisting principally of old-field pine, sassafras, sweetgum, and persimmon. Some parts are in lespedeza hay; some selected areas are in general field crops, mainly cotton. Lespedza is the principal pasture plant, but Dallis, Bermuda, Johnson, and other grasses in time establish themselves by voluntary seeding.

The present eroded condition of the soil is largely the result of unsuitable practices of management, especially tillage without proper control of surface runoff. Terracing would improve a few areas enough to permit their use for general field crops. The soil is well suited to kudzu, probably the best crop for both pasture and hay that can be produced on severely eroded land. Kudzu also is considered highly useful for controlling erosion. The less severely eroded areas can be used for sericea lespedeza, which is considered good for hay and supplementary pasture. Common white clover, hop clover, Dallis grass, orchard grass, and possibly Kentucky bluegrass may be used for improved pasture where the soil is properly protected from erosion and properly fertilized and receives other good management.

Fullerton silt loam, undulating phase (2–5% slopes) (Fsu).—This phase occurs in undulating areas on ridge tops in close association with Fullerton cherty silt loam, rolling phase. To some extent it is also associated with Dewey, Talbott, and Colbert soils on the chert ridges of the main limestone valley and on cherty slopes in the Paint



depth; generally contains a relatively large quantity of fine chert and grit but in places is very smooth and nearly free of chert and grit; very strongly acid.

10 to 27 inches, reddish-yellow to yellowish-red friable cherty silty clay loam to silty clay, some gray mottling; somewhat sticky and plastic when wet, especially in the lower part of layer; chert content varies from place to place but chert generally makes up most of the lower part of the layer; very strongly acid.

27 to 45 inches, yellowish-red to yellowish-brown silty clay; contains a large quantity of sharply angular chert fragments; very strongly acid.

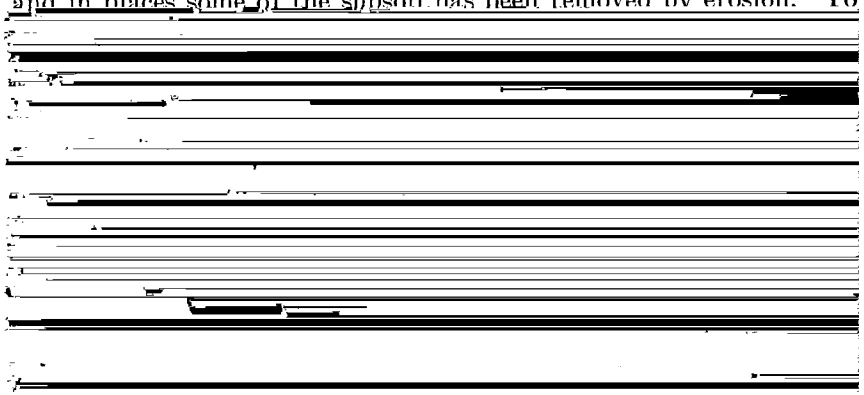
The quantity of grit in the surface and subsurface soil varies from place to place, and the grit particles are generally very small. The chert fragments are mostly less than 1 inch in diameter.

Use and management.—Fullerton silt loam, undulating phase, is less erosive than Dewey or Cumberland soils on similar slopes, but in most cultivated areas it would probably benefit by being terraced to control erosion. The uneroded or only slightly eroded soil generally has good moisture-absorption and fairly good moisture-holding capacity. Its tilth conditions are in general good, although not so good as those of uneroded or only slightly eroded Dewey, Cumberland, or Etowah soils. The chert or gritty material in the soil aids moisture absorption and helps maintain a friable surface soil that will not bake or crack in dry periods. The content of chert is not sufficient to interfere materially with tillage. The soil is severely leached and inherently less fertile than Dewey, Cumberland, Etowah, and many other soils of the limestone valleys.

This phase has many good qualities and responds well to good management. It is desirable for general crops and practically all of it is cultivated each year. Cotton, corn, lespedeza, soybeans, and oats are the main crops. Under good management cotton yields about ⅘ bale an acre, and corn from 30 to 45 bushels.

Fullerton silt loam, eroded undulating phase (2–5% slopes) (FSE).—This phase occupies gently rounded to nearly level ridge tops and very gentle slopes. It occurs in close association with the undulating phase, and with Fullerton cherty silt loam, rolling phase. External drainage is good to slightly rapid, and internal drainage is nearly everywhere good. The native vegetation consisted of deciduous hardwoods, vines, underbrush, and in places some pines and cedars.

From half to more than three-fourths of the original surface soil and in places some of the subsoil has been removed by erosion. To



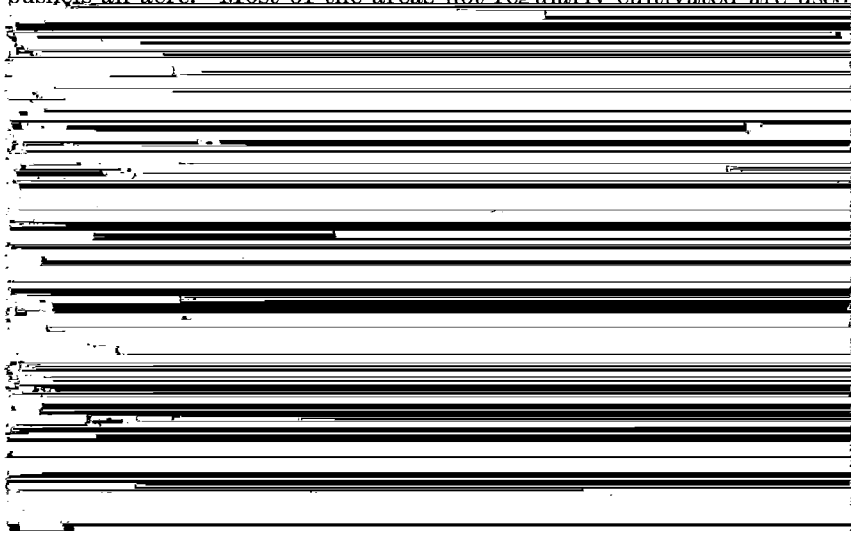
gullies may form unless the soil is protected by terraces or other means of erosion control. Although many good qualities have been adversely affected by the loss of the friable surface soil through accelerated erosion, this phase can be built up to a fairly productive state by terracing and other soil-improvement practices.

All the phase has at some time been cultivated, and most of it is used for general farm crops. Cotton and corn are the principal crops. Cotton produces ⅓ to ¾ bale an acre under management that includes fertilization with 250 to 400 pounds an acre of 6–8–4 or some other high-grade fertilizer. Corn produces 12 to 25 bushels an acre if it receives 100 to 200 pounds an acre of nitrate of soda or if it follows a legume.

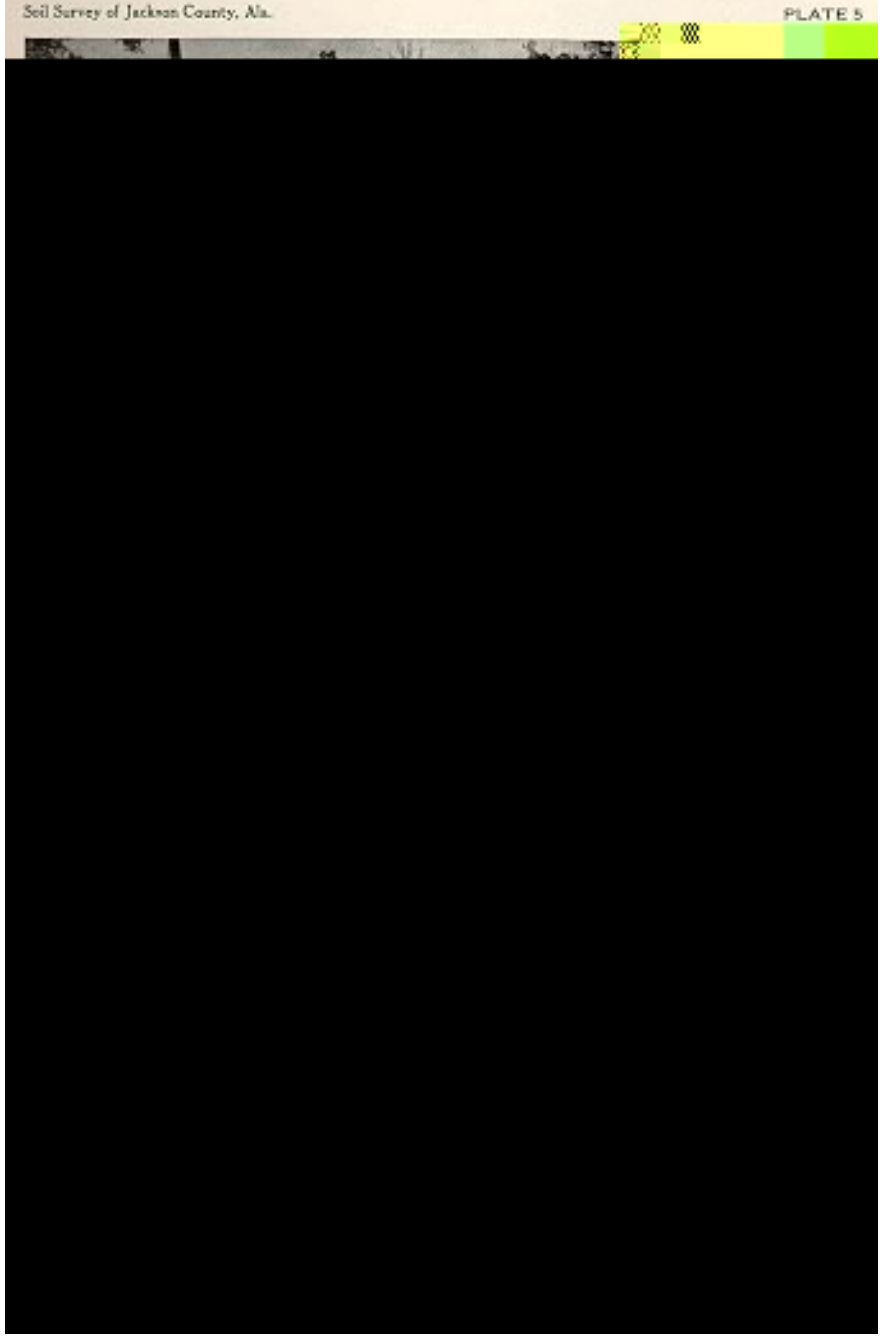
Fullerton silt loam, eroded rolling phase (5–12% slopes) (FSN).—This phase occurs in rolling areas in the Paint Rock River valley and the valleys of tributary streams and in a few scattered valleys and coves. It has a light reddish-brown or reddish-yellow color to plow depth and its cherty subsoil is yellowish red to brownish red. In degree of erosion and profile characteristics it resembles the eroded undulating phase, but it differs in having stronger slopes.

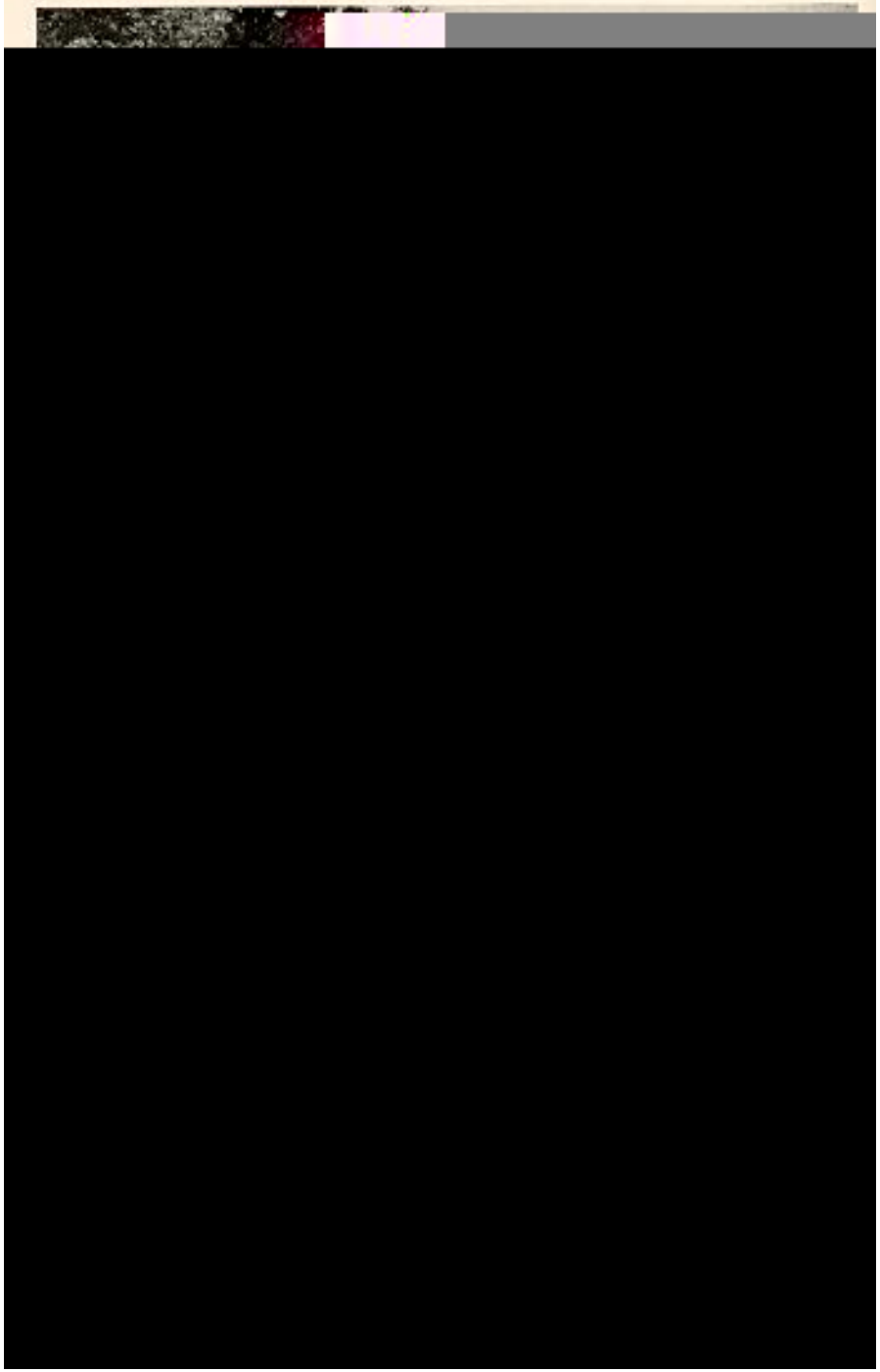
Under virgin conditions external drainage was good, but after the native vegetation was removed and the soil was opened to cultivation, external drainage became rapid to excessive. Internal drainage is good to slightly rapid. The surface soil has been altered by sheet and shallow gully erosion. About half to three-fourths of the original surface soil and, in places, some of the subsoil have been washed away. There are a few deep gullies; exceptionally large ones and very severely gullied areas are designated on the soil map by symbol.

Use and management.—All of Fullerton silt loam, eroded rolling phase, is cleared land used for general farm crops. About 75 percent of the total area is now used annually for cotton and corn. Under good management yields are fair to good. Cotton yields of ⅓ to ⅔ bale an acre are most common, and corn yields range from 15 to 25 bushels an acre. Most of the areas not regularly cultivated are used



Internal drainage is rapid in the surface soil and good to fair in the subsoil. Cleared areas of this phase have lost a fourth to a half of their original surface soil through erosion. About a third of the area





by being redder, thinner, heavier, and less friable. It ranges from 3 to 7 inches thick and passes directly into the heavier and tighter subsoil. The combined depth of the original surface soil and subsurface soil ranged from 9 to somewhat more than 14 inches, an average of 11 inches.

Use and management.—Mainly because so much of the friable surface soil and subsurface soil has been lost through erosion, the workability (including tilth conditions), moisture absorption, organic content, and drought resistance of Fullerton cherty silt loam, eroded rolling phase, have been reduced. Likewise, its susceptibility to erosion, loss of moisture by runoff, and problems of conservation have increased. All the phase has been cleared. Probably 65 percent is used annually for crops. The rest is largely in permanent pasture, although some is idle. A common practice is to use the areas 2 or 3 years for lespedeza pasture or to allow them to remain idle 1 to 3 years. The areas are then used 1 or 2 years for corn, following which they are planted to cotton, returned to lespedeza pasture, or left idle.

Cotton, corn, and hay are the principal crops. Corn is not well suited unless erosion has been reduced by terracing or other control measures and the soil has been built up by green-manure crops or other legumes. When corn follows a winter legume or is fertilized with 100 to 200 pounds of nitrate of soda, yields of 18 to 25 bushels are common. Under management that includes application of 300 to 400

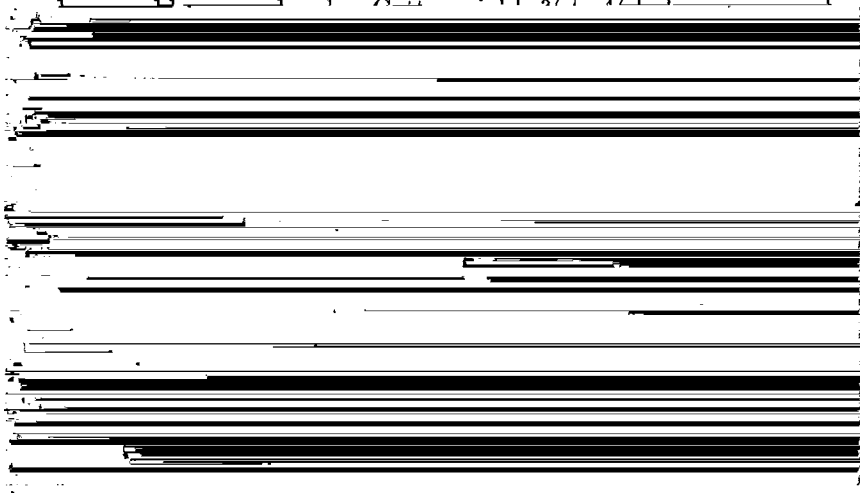
The soil layers vary, especially in color, from place to place, but usually the subsoil has some red. Areas where the subsoil is dark brownish red have some gray. The chert fragments vary in size. In most places they range up to 8 inches in diameter but in others many of them are 10 to 24 inches in diameter. The larger fragments are usually removed to facilitate tillage. Areas containing a relatively large quantity of water-worn gravel or small cobbles are designated on the soil map by symbol.

Use and management.—Fullerton cherty silt loam, undulating phase, is leached of all soluble carbonates. It is fairly low in plant nutrients but apparently not so low as Clarksville soils, as it is more productive than the associated Clarksville cherty silt loam, rolling phase. Tilth conditions are fairly good, moisture absorption very good, and moisture-holding capacity fair to good.

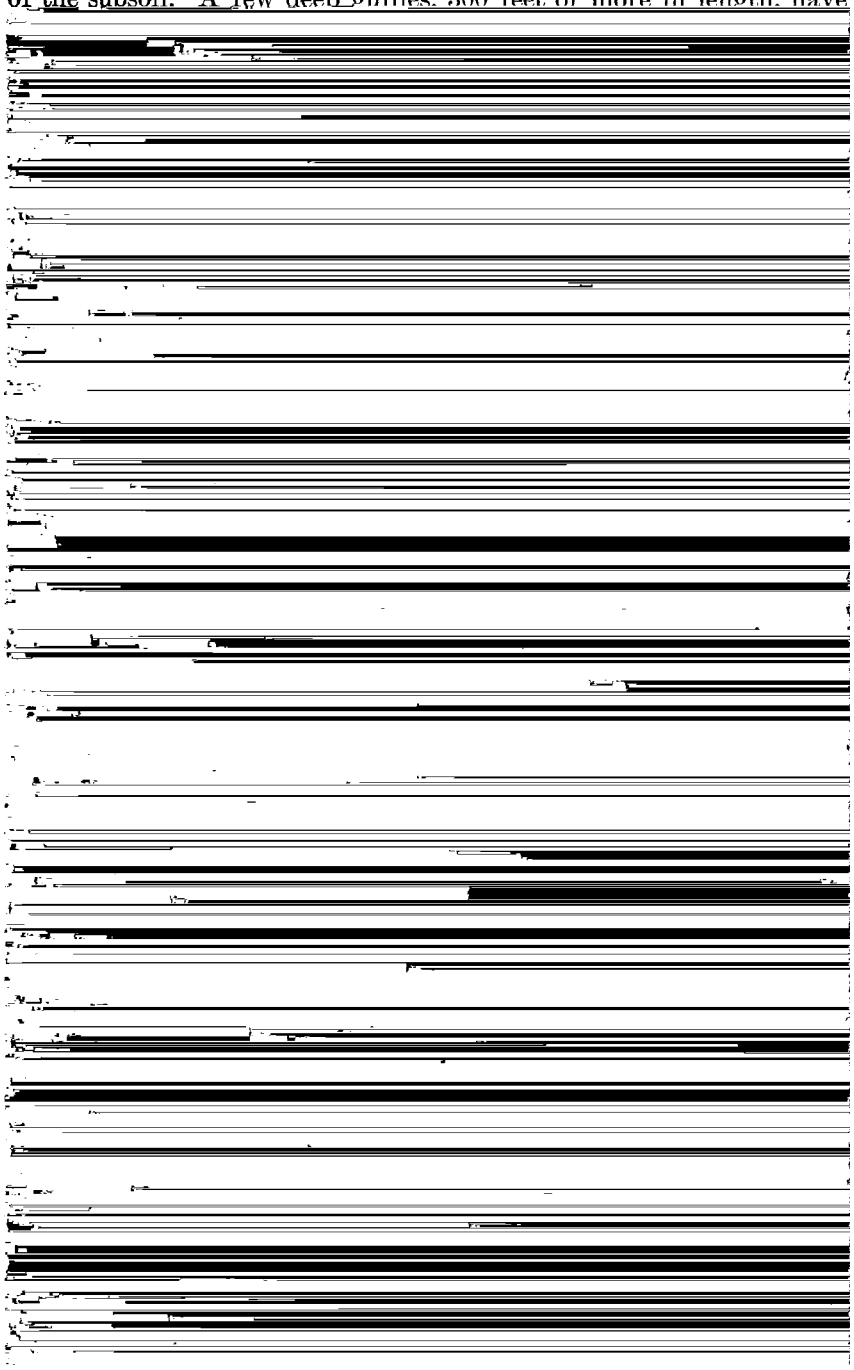
Although the chert fragments do not prevent tillage, they interfere with it. Their sharp edges increase the wear on plows and other tools, and the larger fragments interfere somewhat with the operation of mowers and other cutting machines, particularly those with the cutting bar near or in contact with the ground. On the other hand, the chert fragments tend to reduce the susceptibility of the soil to erosion, the evaporation of soil moisture, and the hardening or baking of the surface soil. The open cherty surface soil increases moisture absorption and provides good aeration. Because the soil warms comparatively early in spring, it is particularly suitable for truck or berry crops grown for early markets or for cotton. On this soil cotton matures before it is seriously damaged by boll weevils.

About an eighth of the total area is in native forest consisting mainly of deciduous hardwoods. Cedar and pine are common in places, however, and abandoned fields and some cut-over areas support stands of old-field pine. Little, if any, of the soil has been planted to pine or other tree seedlings. The land not forested is cleared and in crops and pasture.

This phase is used largely for cotton, corn, hay, and pasture but is also considered desirable for potatoes and sweetpotatoes, home



Half to nearly all the original surface soil has been eroded. In places shallow gully erosion has removed nearly all the surface soil and some of the subsoil. A few deep gullies, 300 feet or more in length, have



fairly good pasture. Hop clover, Dallis grass, and other plants afford some grazing. Corn is the most commonly cultivated crop.

Where other land suitable for crops is scarce, this phase is frequently pastured for 2 years or more and then plowed on the contour and planted to corn for 1 or 2 years. The soil is then sown to lespedeza for pasture. Fair to good yields are obtained by this rotation; however, the soil soon becomes so badly eroded that it remains in pasture or reverts to forest unless more efficient erosion control is used. At present about half the total area is in forest, and the rest is in cropland and permanent pasture. The natural vegetation consists mainly of deciduous hardwoods, with some cedar and pine.

Fullerton cherty silt loam, eroded hilly phase (12–25% slopes) (FcH).—This phase is widely distributed over the principal limestone valley and in the northern half of the Paint Rock River valley. It resembles the hilly phase in most respects, the main difference being its greater erosion. Half to more than three-fourths of its original surface soil has been removed by sheet and shallow gulley erosion. External drainage is very rapid to excessive; internal drainage is rapid in the surface soil and good to rapid in the subsoil.

About 80 acres of the eroded hilly phase of Dewey cherty silt loam are included with this phase. Unlike Fullerton cherty silt loam, eroded hilly phase, the included Dewey soil has generally less chert in its surface soil and subsoil and is deeper over the underlying cherty clay. The Dewey soil has a grayish-brown friable cherty surface soil and a relatively chert-free red and firm but moderately friable silty clay subsoil, which is underlain by a deep mass of highly cherty clay somewhat finer than that underlying the subsoil of Fullerton and Clarksville soils. The parent material is partly residual and partly colluvial in origin.

The included phase occurs on hills or steep slopes in the chert ridges and red hills in the limestone valleys, where it is closely associated with the hilly and steep phases of Fullerton cherty silt loam. Its slopes are similar to the eroded hilly phase with which it is mapped. Some areas are on converging slopes similar to those occupied by Greendale cherty silt loam, eroded rolling phase, except that they are stronger. Nearly half the total area of this included soil is about 2 miles south-southwest of Bellefonte Island. Other areas are 1 mile northeast of Bellefonte Island, 1½ miles south of Bridgeport, 1½ miles northeast of Caperton Ferry, and ½ mile southeast of Long Island.

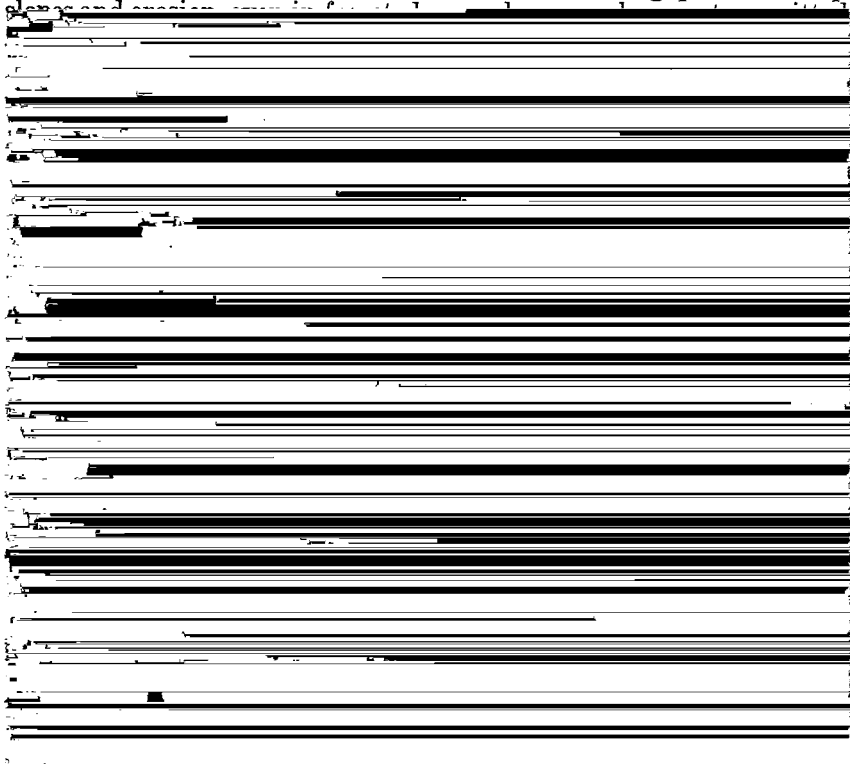
Use and management.—All of Fullerton cherty silt loam, eroded hilly phase, has been cleared and is in crops and pasture. Probably not more than 25 percent is used annually for general farm crops. In the northern half of the Paint Rock River valley a slightly higher percentage may be cropped. The best use for this phase apparently is for pasture and forest. The more severely eroded areas can be used either for trees or for sericea lespedeza hay or pasture. Harvesting the hay crop is relatively difficult because of the steepness of slope and chert on the surface. The best plan is to pasture the kudzu periodically throughout the summer.

As in the other hilly cherty soils, the common practice is to alternate pasture and field crops, but no systematic rotation is usually employed. Many farmers, however, pasture the areas for 2 years

or more and then plant them to corn for 1 to 2 years. Afterwards they either return the land to pasture or plant it to cotton. Under this plan little fertilizer is used for the corn, and fair yields can be obtained. Corn produces 13 to 18 bushels an acre, and cotton ⅕ to ½ bale. Cotton is usually fertilized with a light application of a complete fertilizer.

Practically all the included soil—Dewey cherty silt loam, eroded hilly phase—has been cleared for cultivation, but largely because of its strong slopes and susceptibility to erosion most of it has been abandoned for general farm crops. More than half the total area is covered with volunteer old-field pine. Volunteer sweetgum, persimmon, dogwood, hickory, and oak are also fairly common in places. The rest of the soil is used mostly for either open or woodland permanent pasture, in which common lespedeza, hop clover, Dallis grass, and other grasses and legumes furnish fairly good grazing. Sericea lespedeza is probably the best crop, as it is highly useful either for hay or for supplementary grazing. Periodic grazing appears to be more satisfactory than continuous grazing on this included soil.

Fullerton cherty silt loam, steep phase (25–40% slopes) (FcZ).—This phase occurs chiefly on the red hills east of Bellefonte Island and southwestward nearly to the Jackson-Marshall County line. It differs from the hilly phase primarily in having steeper slopes. The parent material is similar to that of other Fullerton soils, and the surface and subsoil are fairly similar in color to the rolling phase. Steep



original surface soil but has the same cherty character. Little difference between the nature of the subsoil and that of the virgin soil is evident.

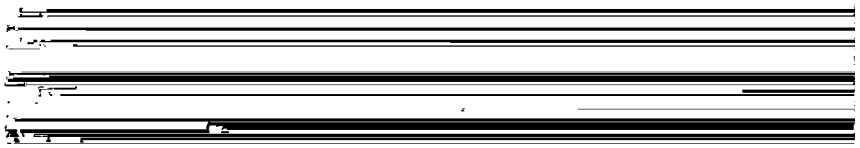
The soil is closely associated with other Fullerton soils and with Clarksville and Hermitage soils. As mapped it includes areas of Clarksville cherty silt loam, eroded steep phase, which has similar parent material and use suitability. It also includes an area of about 450 acres of Fullerton silty clay loam, severely eroded steep phase. The included Fullerton soil is similar to the other steep phases of Fullerton soils in character of parent material, chert content, surface relief, and subsoil characteristics, but it is more eroded, having lost practically all the original surface soil and subsurface soil through accelerated erosion. Sheet erosion, shallow gully erosion, and to some extent deep gully erosion have been active in reducing the soil to its eroded state. Excessively gullied areas and large individual gullies are designated on the map by symbols. External drainage is excessive, and internal drainage is generally rapid to excessive near the surface and good to rapid in the lower subsoil.

Use and management.—Practically all of Fullerton cherty silt loam, eroded steep phase, is cleared. Most of it has been used at some time for general farm crops and pasture, and about 10 to 15 percent is now used for general field crops. A common practice is to alternate field crops and pasture at intervals of 2 to 4 years. The soil is usually reseeded to common lespedeza and other well-established pasture plants. It is then pastured 2 to 4 years and afterwards cropped to corn 1 or 2 years. Occasionally cotton follows corn after the first year. Very little if any fertilizer is used for pasture or field crops. Sometimes cotton receives an application of 200 to 300 pounds of 6–8–4 or other high-grade fertilizer.

This phase is difficult to work because of its steep slopes and many chert fragments. Erosion has impaired tilth conditions, reduced moisture absorption, and increased surface runoff and susceptibility to erosion. With its loss of organic matter and comparatively poor response to good management, as well as other unfavorable features, the soil generally is not well suited to field crops and pasture. Under present economic conditions the best use seems to be for forest. Sericea lespedeza can be grown for temporary grazing and for controlling erosion.

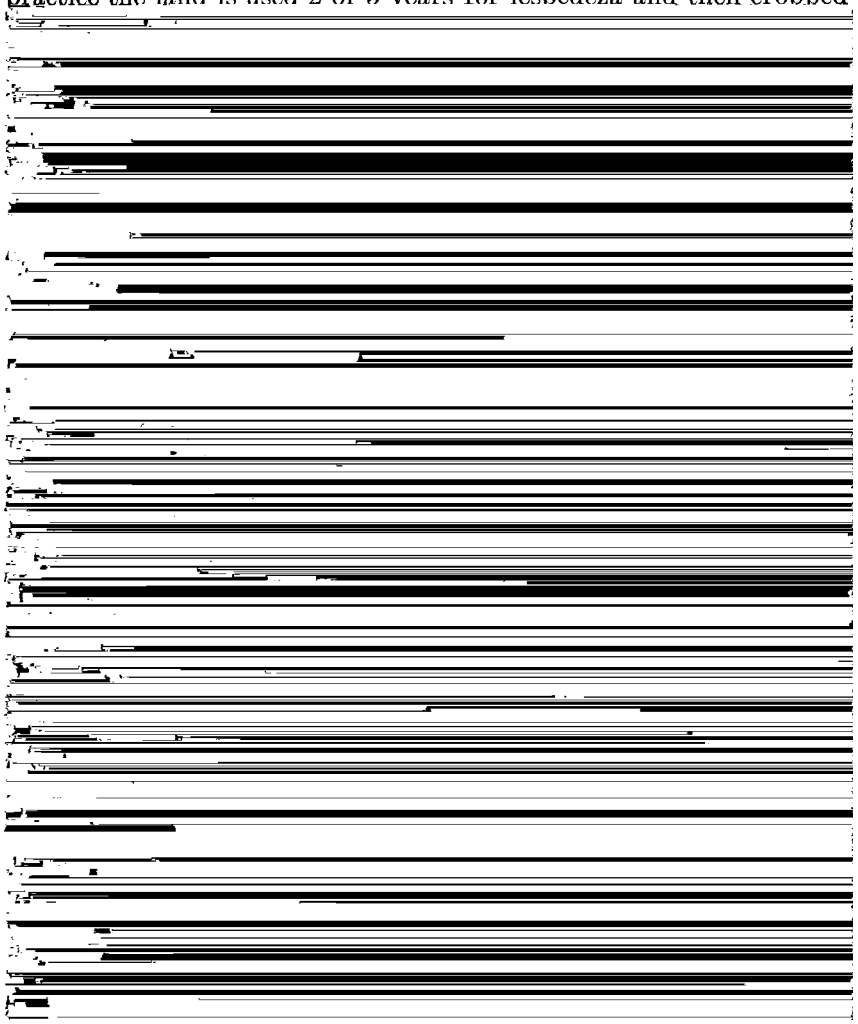
All of the included Fullerton silty clay loam, severely eroded steep phase, is cleared and at some time has been used for tilled crops and pasture. Very little of it, however, is now cropped, and most areas are in permanent pasture or idle. The soil is difficult to work and conserve and is best suited to forest and pasture. It is suited to sericea lespedeza, which can be used for pasture where better pasture land is limited or is unavailable and which serves to control erosion. Some areas have been abandoned to forest vegetation, mainly old-field pine, sweetgum, persimmon, sassafras, and black locust.

Fullerton cherty silty clay loam, severely eroded rolling phase.



soil material have been removed so that the plow layer consists largely or wholly of reddish-yellow or yellowish-red subsoil material. In its virgin condition the phase was relatively shallow, and after a loss of 6 to more than 10 inches of surface soil and subsurface soil, it is not deep enough to be a good soil.

Use and management.—All of Fullerton cherty silty clay loam, severely eroded rolling phase, has been used at some time for tilled crops. Under present conditions, however, not more than 35 percent is planted to general farm crops; most of it is in permanent pasture. Lespedeza, hop clover, Dallis grass, and native plants supply most of the grazing. Because of the cherty and relatively strong slopes, it is less suitable for hay than for pasture. The more severely eroded areas can be used best for sericea lespedeza or for trees. A common practice is that of alternating pasture and tilled crops. Under this practice the land is used 2 or 3 years for lespedeza and then cropped



8 to 16 inches, grayish-brown friable cherty heavy silt loam; yellowish brown when moist; easily crumbled when moderately moist, sticky when wet; medium to strongly acid.
16 to 36 inches, grayish-brown friable cherty clay loam mottled with gray, yellow, and brown; strongly to medium acid.
36 to 48 inches, light yellowish-brown friable cherty clay loam to cherty clay mottled with gray, yellow, brown, and red; strongly to medium acid.

Variations in this soil are usually in depth and in the quantity of small chert fragments, grit, water-worn pieces of gravel, and coarse chert fragments 2 to 6 inches or more in diameter. In a few areas the soil is relatively free of chert fragments and contains a high percentage of silt and fine grit.

Use and management.—Greendale cherty silt loam, undulating phase, has fair to good workability, moisture absorption, and moisture-holding ability. In general it is moderately high in organic matter but inherently somewhat low in plant nutrients. In most areas, however, it responds fairly well to good management. It is satisfactory for winter legumes, except in some level areas where the water table is high in winter as a result of nearly constant seepage of water.

This phase is used chiefly for general farm crops. Corn is the principal crop, but cotton, soybeans, lespedeza, sorghum, sweetpotatoes, and potatoes are also commonly planted. Corn yields range from 15 to 40 bushels an acre, and cotton yields from 2/5 to 1 bale an acre, depending to a large extent on season and type of management. The sorghum sirup is of better quality than that produced on most soils in the limestone valleys.

Greendale cherty silt loam, eroded undulating phase (2–5% [redacted]

undulating phase. The surface soil, however, is nearly everywhere slightly darker gray and the subsoil slightly more mottled with brown and gray, indicating somewhat slower drainage in both surface soil and subsoil. The parent material is the same in both soils.

In places this phase is closely associated with Ooltewah silt loam, a more poorly drained soil. The separation of these soils on the map is arbitrary and is based largely on the character of the parent material. Areas with highly gritty or cherty material are classified with the Greendale soil; those with smooth silt loam or silty clay loam material are classified with the Ooltewah. In larger areas where both soils can be definitely outlined they are classified on the basis of drainage differences.

Use and management.—Practically all of Greendale cherty silt loam, level phase, is used for permanent pasture. Corn is the main grain crop and soybeans and lespedeza are the main hay crops. Cotton is grown on some of the better drained areas, especially those improved by artificial drainage. The soil, however, is better suited to corn, hay, and pasture than to cotton. Corn generally yields 15 to 35 bushels an acre and soybeans 3/4 to 1½ tons of hay an acre, depending to some extent on management. The soil is well suited to sorghum, and good yields of excellent sirup are obtained. Oats can be grown on the better drained areas and under good management produce large yields.

Greendale cherty silt loam, eroded rolling phase (5–12% slopes) (GcN).—This phase, which occurs mainly near the base of long or fairly steep cherty slopes, is similar to the eroded undulating phase in physical characteristics but differs in having rolling relief. It is closely associated with Fullerton and Clarksville soils, being separated from them mainly on the basis of depth of the colluvial parent material to the underlying residual cherty material. The parent material is largely old colluvial material accumulated under forest cover that held it in place over a long period of time and permitted the formation of a distinct texture profile.

External drainage was good under forest cover but has become rapid to excessive since the soil was cleared for cultivation. Also, erosion has become active. Internal drainage was commonly good under forest cover, but under present conditions it is rapid to somewhat excessive in the surface soil and usually good in the subsoil. The present surface soil consists of remaining surface soil and subsurface soil that have been mixed by tillage with subsoil material.

Use and management.—Most of Greendale cherty silt loam, eroded rolling phase, is cleared, but a small area has never been cleared. Some of the tilled areas are only slightly eroded, but most of them have lost half to three-fourths of their original surface soil. Erosion has adversely affected tilth conditions and moisture absorption. It has increased surface runoff and the soil's susceptibility to further erosion and has made difficult the conservation of soil and moisture.

Probably not more than 60 percent of this phase is used annually for general field crops; much of the rest is in permanent pastures. Cotton, corn, and soybeans are the most common crops, and under good management give fair to good yields. Cotton generally produces 1/4 to 2/3 bale or more an acre under management that includes application of 250 to 400 pounds of 6–8–4 or other high-grade fertilizer. Corn

produces 15 to 30 bushels an acre under management that includes application of 150 to 200 pounds of nitrate of soda or allows corn to follow a leguminous crop. Soybeans commonly produce ½ to 1 ton of hay an acre without the use of fertilizer if they follow a well-fertilized cotton crop.

Proper terracing aids in reducing the loss of the friable surface soil in most areas. On some of the longer steeper slopes, however, soil conservation is not easy. These slopes can be protected best either by returning them to forest or by using them for pasture and close-growing field crops.

Guthrie silt loam (0–2% slopes) (GL).—This soil occurs as small areas in slight depressions, broad sinks, and slightly dished flats in the limestone valley uplands, especially in the chert-ridge areas, where it is closely associated with Fullerton, Clarksville, Dewey, Colbert, and Greendale soils. The parent material is colluvial and alluvial in origin, consisting largely of silt and clay washed from Fullerton and Clarksville soils. The native vegetation consisted largely of willow, water, post, and white oaks, sweetgum, blackgum, and swamp maple. Cedar, holly, and beech grow to some extent, and vines and briers are common.

Both external and internal drainages are very slow. Most areas are depressional in form and have either no natural drainage outlets or inadequate outlets. In some areas drainage can be improved by open ditches or tiling. In some places artificial drainage is difficult; in others it is impossible.

Profile description:

0 to 3 inches, gray to dark-gray finely granular to mellow floury silt loam; strongly acid.
3 to 7 inches, light-gray or almost white loose friable silt loam; very smooth and mellow; very strongly to strongly acid.
7 to 30 inches, grayish-yellow plastic silty clay splotched or mottled with shades of gray, brown, yellow, and reddish brown; heavier and more plastic with increasing depth; a few small dark-brown or nearly black iron concretions; strongly to very strongly acid.
30 to 48 inches, gray plastic clay intensely mottled with bluish gray and reddish brown; strongly to very strongly acid.

In most areas wash from adjoining slopes is deposited now and then on this soil. In some areas the surface soil is brown or reddish brown as a result of recent wash from adjacent red soils.

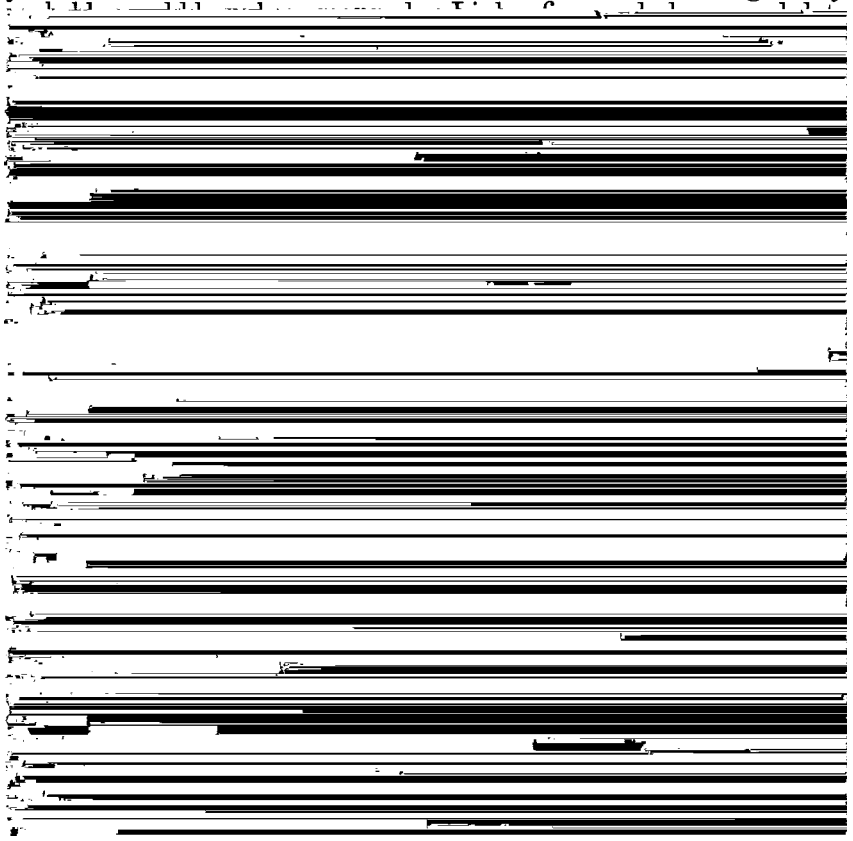
Use and management.—Guthrie silt loam is used chiefly for open or woodland pasture. Most areas are best suited to permanent pasture. Well-drained areas and places that can be drained feasibly can be used for corn and hay. Corn, soybeans, lespedeza, and sorghums are the principal crops grown (pl. 6, *B*). Crop yields vary with drainage differences. Well-drained areas produce yields nearly equal to those on Ooltewah silt loam, but on the whole crop yields are low. Permanently wet spots that are difficult to drain can be used for trees or woodland pasture.

Hanceville fine sandy loam, undulating phase (2–5% slopes) (HNU).—This phase occurs on the sandstone upland plateaus, where it occupies narrow divides, small relatively level and nearly isolated plateaus, and adjacent escarpments, in all of which both internal drainage and aeration have been exceptionally good over a long period of time. It is closely associated with the Hartsells soils, especially Hartsells fine sandy loam, undulating phase, and resembles them in texture and friability. It differs, however, in having a browner surface soil and red subsoil. It is derived from weathered products of sandstone and, in places, shale. The native vegetation consisted largely of deciduous hardwoods, with a few shortleaf and old-field pines in many areas.

Profile description:

0 to 8 inches, reddish-brown fine sandy loam; contains a moderate quantity of organic matter to a depth of 2 to 3 inches in forested areas.
8 to 32 inches, brownish-red to reddish-brown friable fine sandy clay; somewhat sticky when wet.
32 to 60 inches, similar to the overlying layer in color and texture but more sticky.
60 inches +, in some places at 36 inches but in others as deep as 84 inches is yellowish-brown fine sandy loam mixed with partly weathered sandstone fragments.

In gently rolling areas on the wide plateaus northwest of Section the subsoil is reddish in higher places and on relatively sharp breaks and yellow or yellowish brown on gentle slopes and the nearly level tops of wide divides. These included areas have a reddish color typical of Linker soils (not mapped in the county), and the color is the chief difference between these areas and those of the light reddish-brown to yellowish-red Hanceville soils. If the included areas were larger they



tions of 100 to 225 pounds of nitrate of soda. Soybeans yield ¾ to 1½ tons an acre, and little or no fertilizer is used when they follow cotton, potatoes, or other highly fertilized crops.

This phase is well suited to pasture. For best results the land should be well prepared and fertilized with 1 ton of basic slag, which is sufficient to last for several years. Annual applications of 500 pounds of basic slag an acre may be used. Other possible fertilizer treatments are 1,000 pounds of superphosphate an acre and 1 ton of lime or 300 pounds of superphosphate and 500 pounds of lime. A good pasture mixture for this soil is 10 pounds of Dallis grass, 10 pounds of annual lespedeza, and 2 pounds of white clover. Orchard grass, hop clover, and Kentucky bluegrass can also be included.

Hanceville fine sandy loam, eroded undulating phase (2–5% slopes) (HNE).—This phase, one of the redder soils on uplands in the sandstone plateaus, occurs in small areas scattered on Sand Mountain. It is derived largely from weathered sandstone material. It is similar to the undulating phase but differs in being moderately eroded. From half to three-fourths of the original surface soil has been lost by erosion. Subsoil material has been mixed with the remaining surface soil by tillage, and the soil to plow depth is therefore redder and more subject to baking.

Use and management.—Practically all of Hanceville fine sandy loam, eroded undulating phase, is cultivated. It is used mainly for

stronger and one-half to three-fourths of the original surface soil has been removed by erosion. This phase has a 4- to 5-inch brown fine sandy loam surface soil and a red friable fine sandy clay subsoil. The subsoil, exposed in places, gives this phase the appearance of having the reddest surface soil on the sandstone plateaus. In most places ordinary plowing brings subsoil material to the surface.

Use and management.—Despite erosion, the productivity of Hanceville fine sandy loam, eroded rolling phase, has not been seriously impaired, especially where the soil has been improved by terracing, deep plowing, and the turning under of legume crops. It is very responsive to good management and nearly as productive as the rolling phase under the same management. The loose deep subsoil absorbs and retains moisture well.

Practically all the phase is cultivated, but in a few small areas pasture and row crops are rotated. Cotton, corn, soybeans, and lespedeza are the principal crops. On the steeper slopes, kudzu or sericea lespedeza may be the best crop. The yields obtained under current management, which does not include systematic crop rotations but does include an occasional winter or summer legume, are as follows: Cotton, ½ to ¾ bale an acre when fertilized with 250 to 400 pounds of 6–8–4 or other high-grade fertilizer; and corn, 15 to 30 bushels when fertilized with 100 to 200 pounds of nitrate of soda or when the crop follows a legume that has been turned under.

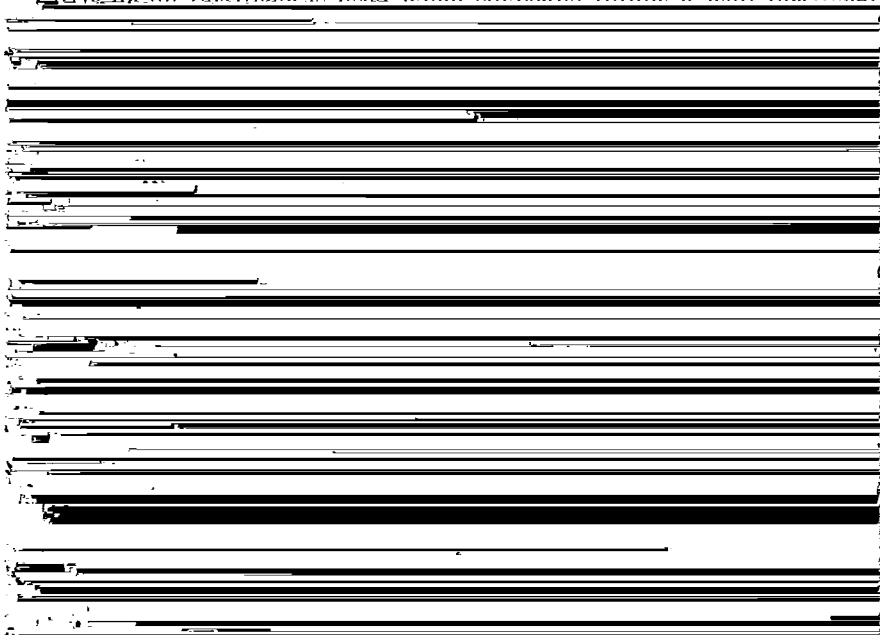
Hartsells fine sandy loam, undulating phase (2–5% slopes) (HFU).—This phase is well distributed over the standstone upland plateaus. The largest areas are on Cumberland Plateau, Keel Mountain, and the southern half of Sand Mountain. The soil resembles

45 inches +, partly weathered sandstone fragments mixed with soil material; strongly acid; bedrock at 30 to 96 inches but usually about 48 inches.

The texture is uniformly fine sandy loam throughout the southern part of Sand Mountain; elsewhere it ranges from fine sandy loam to very fine sandy loam. Throughout these areas the parent rock includes interbeds, or strata, of shale with the sandstone. Near Browntown on Sand Mountain is a relatively large nearly level area in which the depth to bedrock is not more than 26 inches and the texture is very fine sandy loam. The native vegetation consisted largely of deciduous hardwood trees, with a few pines especially in cut-over areas and abandoned fields.

Use and management.—The position of Hartsells fine sandy loam, undulating phase, is favorable for agriculture. The soil absorbs and holds moisture well and has good aeration. About 80 percent of the total area has been cleared for cultivation. Land not cleared is largely in the northeastern part of the county and on the Cumberland Plateau and smaller plateaus. Good roads are now built into these areas, and soon all the soil except that on extremely small isolated mountaintops will probably be cultivated.

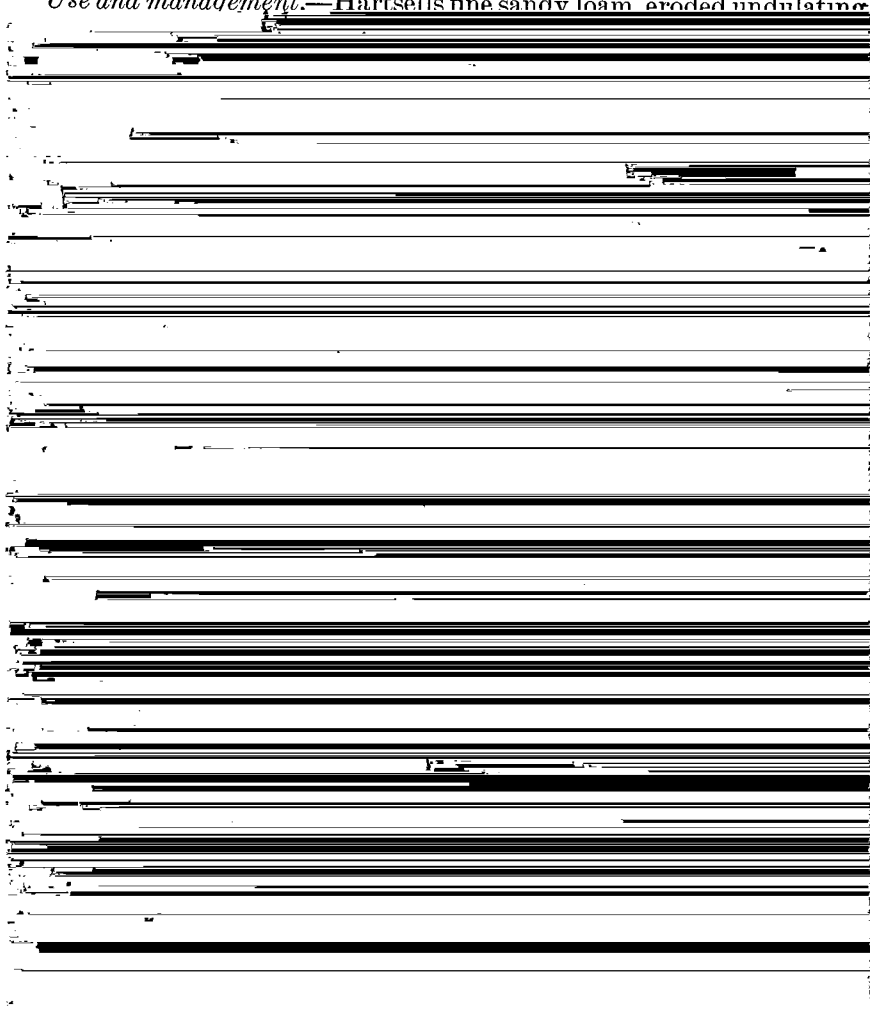
The usual crops are cotton, corn, peanuts, soybeans, sorghum, and potatoes. These crops normally give good yields but need large applications of fertilizer unless a cover crop is turned under. Most farmers depend almost entirely on commercial fertilizer for plant nutrients. Cotton normally yields ⅗ to 1 bale an acre under management that includes applications of 300 to 600 pounds of 6–8–4 or other high-grade fertilizer. Corn yields 30 to 50 bushels when the crop follows a winter cover crop or when fertilized with 100 to 225 pounds of nitrate of soda. Soybeans yield ¾ to 1½ tons of hay. Little or no fertilizer is used when soybeans follow a well fertilized



and 500 pounds of lime. A suitable pasture mixture consists of 10 pounds of Dallis grass, 10 pounds of annual lespedeza, and 2 pounds of white clover. Orchard grass, hop clover, and Kentucky bluegrass can be added to this mixture.

Hartsells fine sandy loam, eroded undulating phase (2–5% slopes) (HFE).—Most of this phase occurs as relatively small areas in close association with other Hartsells soils and with Enders, Hanceville, Crossville, and Muskingum soils, mainly on Sand Mountain but also on the smaller mountains. The largest areas are northeast and east of Pisgah and on the northern slope of Sand Mountain. The soil is similar to the undulating phase but is more eroded. One-fourth to three-fourths of the original surface soil has been removed. Poor management is the principal cause of erosion. Both external and internal drainage are good to excellent in the terraced areas, but external drainage may be somewhat rapid on unprotected areas.

Use and management.—Hartsells fine sandy loam, eroded undulating



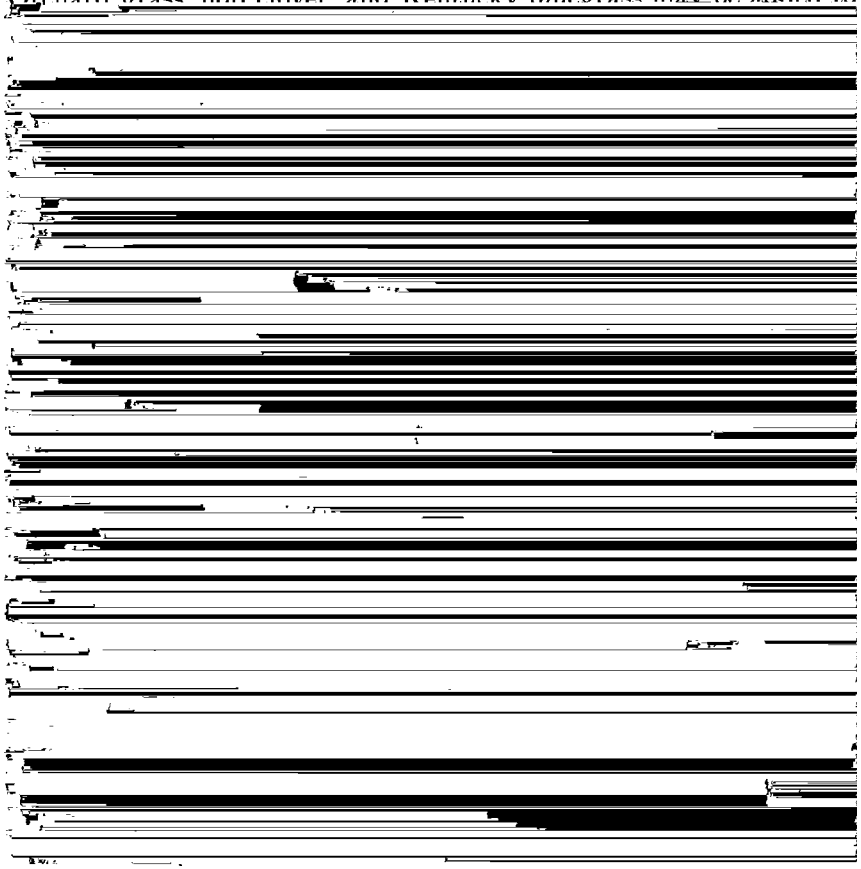
rotation of field crops and pasture. The principal crops are cotton, corn, and soybeans, with some lespedeza. A few isolated areas have returned to forest vegetation. Current management practices do not in general include systematic crop rotations but provide for an occasional winter or summer legume. Cotton yields range from ½ to ¾ bale an acre under management that includes applications of 250 to 400 pounds of a 6–8–4 or other high-grade fertilizer. Corn yields 15 to 30 bushels under management that includes fertilization with 100 to 200 pounds of nitrate of soda or a crop system in which the corn follows a leguminous crop that has been turned under.

The productive capacity of this eroded soil has not been destroyed, especially where the profile is deep to bedrock and the soil is protected by terracing, deep plowing, and growing of cover crops. When good management practices are used, the soil becomes nearly as productive as the rolling phase under the same management. It has a

Most farmers use commercial fertilizer instead of winter cover crops for supplying nitrogen. Progress in the use of winter legumes or other cover crops for green manure is constantly made.

Cropping practices vary; few farmers follow a definite crop rotation. For most economical management, crop rotations should include a leguminous crop to be turned under at least every other year. The phase is well suited to all crops grown in the locality and can be used for any type of crop rotation. The 2- and 3-year rotations are especially well suited to the soil. A rotation consisting of cotton followed by vetch or some other winter legume and corn planted the following spring is recommended. Under this management excellent yields of all the crops can be expected.

This phase is not generally used for pasture. For fair to good results, the land should be well prepared and fertilized with 1 ton of basic slag an acre. This application is sufficient for several years, but annual acre applications of 500 pounds of basic slag may be used. Other methods are to apply 1,000 pounds of superphosphate and 1 ton of lime an acre or to add 300 pounds of superphosphate and 500 pounds of lime. A suitable pasture mixture consists of 10 pounds of Dallis grass, 10 pounds of annual lespedeza, and 2 pounds of white clover. Orchard grass, hop clover, and Kentucky bluegrass may be added to



The parent material consists of residual products derived mainly from weathered sandstone. The depth of the profile to the underlying sandstone bedrock may be 14 to 30 inches, but the more common range is 18 to 26 inches. Outcrops of sandstone bedrock occur in places, and some of them are designated on the soil map by symbol. Under forest cover both external and internal drainage are moderate, but when the soil is cleared and put under cultivation external drainage may become rapid to somewhat excessive unless proper precautions are taken against erosion. Erosion has not been severe in the cultivated areas, mainly because of the short time these areas have been cleared and the use of control measures.

Use and management.—Probably less than a fourth of Hartsells fine sandy loam, rolling shallow phase, has been cleared for pasture or crops. The rolling relief and the shallow depth of the soil over bedrock make these areas questionable for cropland. Many of them have been nearly inaccessible for farming until recent years when roads were extended into them. Others still are isolated because of lack of roads. More of the land, however, is being cleared and used for cultivation. The trees in the forested areas are largely deciduous hardwoods, but shortleaf and old-field pines are common in some areas, especially on Sand Mountain and in most areas that had been cut over for timber or cleared for farming.

Cotton, corn, peanuts, sorghum, and hay are the principal crops. No special system of crop rotation is followed, although a simple rotation of cotton, corn, and soybeans is common. Some—but not enough—farmers grow winter cover crops. Most farmers depend on commercial fertilizer rather than on winter legumes for supplying the soil with nitrogen. Cotton is commonly fertilized with 250 to 300 pounds of 6–8–4 or other high-grade fertilizer an acre and generally yields ⅓ to ⅗ bale. Corn, which is fertilized with 100 to 225 pounds of nitrate of soda, yields 15 to 25 bushels an acre. Soybeans yield ½ to ¾ ton of hay an acre. Peanuts produce ¼ to ½ ton an acre with the use of little or no fertilizer if they are grown in rotation with cotton.

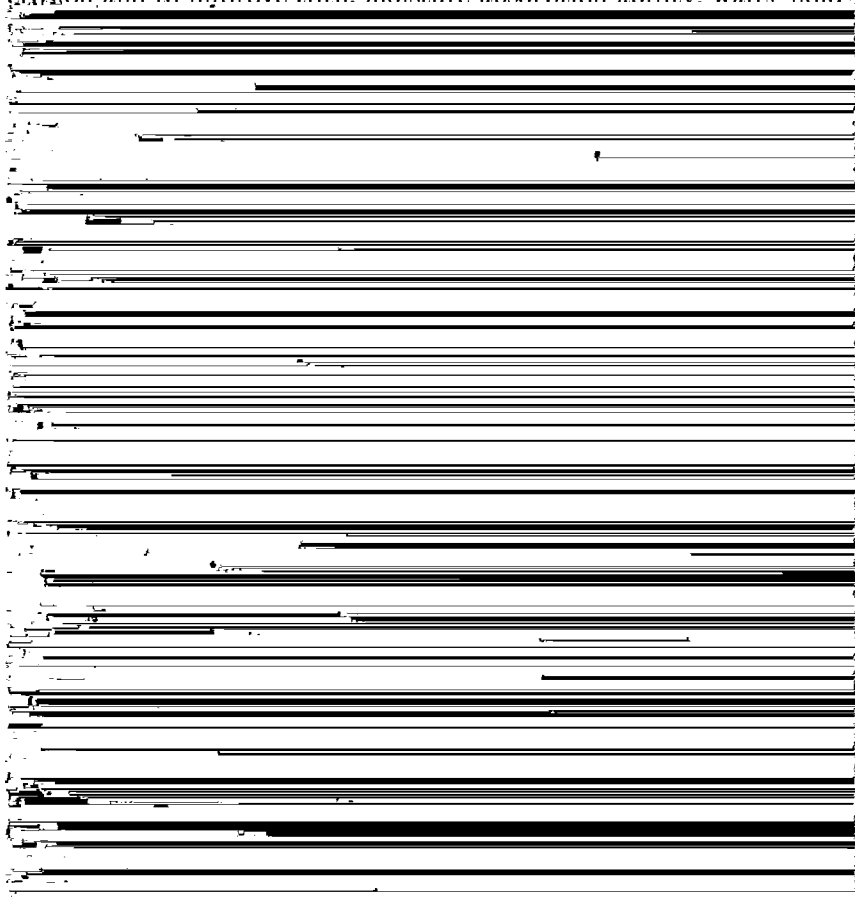
Yields are largely in proportion to the seriousness of the erosion. Wherever possible, a cover crop should be kept on the land most of the time. Kudzu and sericea lespedeza are considered good hay or temporary pasture crops, providing there is enough land for row crops. This soil can be kept in cultivation over a relatively long time if an effort is made to conserve moisture and soil material as soon as the land is cleared.

Hartsells fine sandy loam, eroded rolling shallow phase (5–10% slopes (HFA).—This phase occurs mostly in small areas scattered over Sand Mountain and isolated plateaus. It is similar to the rolling shallow phase in surface relief and position but, unlike that phase, is moderately eroded. Probably three-fourths of the original surface soil has been removed by erosion, and in many places the subsoil is exposed. The average depth of the surface soil is only about 4 inches. External drainage is more rapid than on the rolling shallow phase. Internal drainage is fairly good, although it is slowed to some extent by the bedrock near the surface. The bedrock also causes seepage water to issue on the slopes during wet periods and helps to make water control one of the most difficult problems in farming this soil.

Use and management.—All of Hartsells fine sandy loam, eroded rolling shallow phase, at some time has been cleared and used for cultivated crops. Many of the areas include old fields farmed by early settlers. Many of the sloping isolated areas, whether severely eroded or not, are now either abandoned to volunteer forest vegetation or lying idle. Possibly 60 percent of the phase is used for crops; the rest is mostly in pasture or idle. Many abandoned fields have a cover of broomsedge, but a few have a cover of lespedeza or other pasture that provides grazing.

The principal crops are cotton, corn, and soybeans. Cotton is generally fertilized, and under management that includes applications of 200 to 300 pounds of a 6–8–4 or other high-grade fertilizer, yields normally are ⅓ to ½ bale an acre. Corn also is generally fertilized. Where it receives 100 to 150 pounds of nitrate of soda, yields normally range from 15 to 20 bushels an acre. Soybeans yield ⅓ to ¾ ton of hay an acre.

The greatest management problems are directly related to the shallowness of the profile to bedrock and the relatively strong relief. If this phase is to be used for crops, it should be terraced to control erosion and to improve tilth, moisture-absorption ability, water-hold-



This soil is responsive to good management, and productivity can be increased greatly by good management.

Hermitage silty clay loam, eroded rolling phase (5–12% slopes) (HYN).—Like the other Hermitage soils this phase occupies strips of relatively old local alluvium along the foot of slopes occupied by Dewey, Talbott, Fullerton, and related soils. It is similar to the eroded undulating phase, differing chiefly in its steeper slopes. The two phases are closely associated and are mapped only in the limestone valleys.

Profile description:

0 to 8 inches, reddish-brown friable heavy silt loam to silty clay loam with weak medium crumb structure.
8 to 20 inches, reddish-brown to red firm but moderately friable silty clay loam with medium blocky structure.
20 to 30 inches, reddish-brown to red firm material, moderately friable when low in moisture, but plastic when highly moist; moderately well-developed medium blocky structure.
30 to 42 inches, in most places very firm plastic silty clay or silty clay loam mottled with shades of red, yellow, brown, and gray; layer varies with thickness of the accumulation and character of the underlying residual material; cherty in places.

This phase is medium to strongly acid in all layers. In places a small to moderate number of chert fragments are on the surface and scattered through the soil. The degree of erosion ranges from slight to severe, giving a patchy effect in many fields. The texture of the plow soil varies with the degree of erosion. There is a range also in the thickness of the old accumulated material washed from the higher slopes; the depth may be less than 18 inches to more than 80 inches. As a result, the texture, consistence, and color of the subsoil and deeper layers vary.

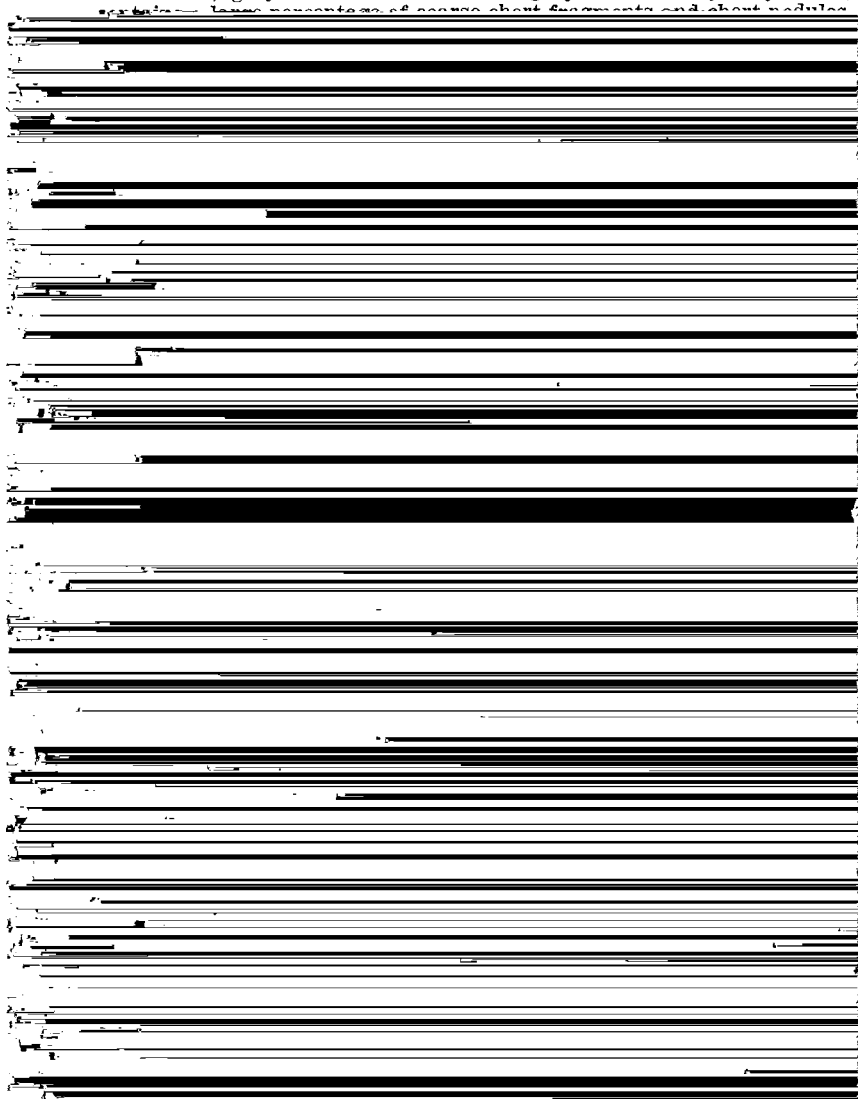
Use and management.—Hermitage silty clay loam, eroded rolling phase, has physical conditions and slopes favorable to moderately intensive use under good management. The prevailing eroded condition has injured the tilth, and the position of this soil at the foot of slopes, where water accumulates, emphasizes the need for water control. The phase, nevertheless, is relatively high in productivity and very responsive to the use of lime, fertilizer, and manure and to most of the other good management practices. In planning the use and management of this soil, both its limitations and its high response to good management should be taken into account.

Hermitage cherty silty clay loam, eroded hilly phase (12–25% slopes) (HTH).—This phase occurs mainly in the northern half of the Paint Rock River valley. The parent material is principally colluvial in origin and consists of residue of weathered cherty limestone rolled or washed from higher limestone slopes. The original forest consisted largely of deciduous hardwoods, cedar, and pine. Abandoned old fields are fairly thickly grown with pine.

External drainage is rapid to excessive. Internal drainage is rapid in the surface soil and good to rapid in the upper subsoil. Drainage may be somewhat slow, however, in the lower subsoil because of the sticky plastic consistence and the shallow depth to bedrock. Seepage water issuing from the soil indicates slow drainage in the subsoil. Erosion has been relatively active and has removed more than half the original surface soil. Despite the strong slopes, however, the soil is not extremely erosive. The large chert fragments and highly cherty condition tend to retard erosion even where cultivated crops are grown.

Profile description:

0 to 8 inches, grayish-brown to brownish-gray friable cherty silt loam to cherty silty clay loam; contains many angular chert fragments less than 1 inch to more than 12 inches in diameter and rounded chert nodules 4 or more inches in diameter both on the surface and in the profile; in nearly virgin areas or in grass-covered areas organic matter produces a dark color to a depth of 2 or 3 inches; medium to slightly acid.
8 to 15 inches, grayish-brown to brownish-gray friable silty clay loam;



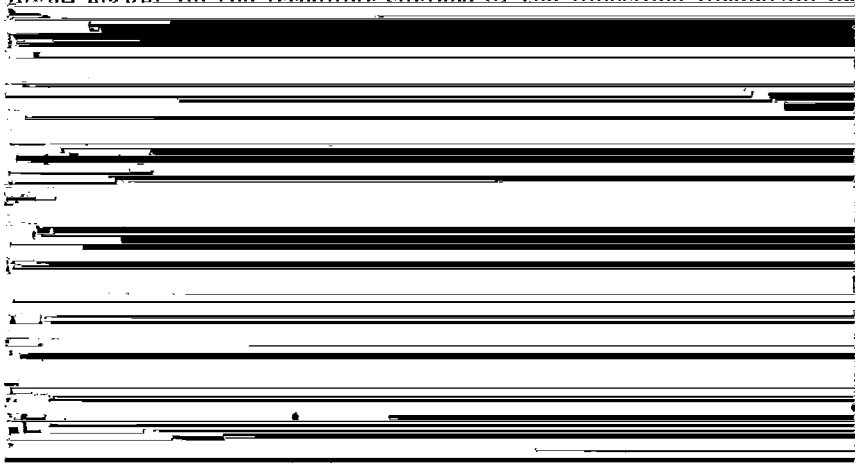
The chert fragments on the surface are less uniformly distributed than on the eroded hilly phase. A few areas with slopes greater than 25 percent are included.

Use and management.—All the areas of Hermitage cherty silty clay loam, severely eroded hilly phase, have at some time been used for crops. Severe erosion has increased the problems of conservation, reduced moisture-absorption and moisture-holding capacity, increased the difficulty of working the soil and planting and harvesting the crops, and restricted the use suitability. The most common and probably best use made of the soil is for pasture. Under common management most areas reseed to common lespedeza. Sericea lespedeza could be used to increase the carrying capacity of pasture. A few areas have reverted to forest vegetation.

Hilly stony land (Muskingum soil material) (10–20% slopes) (HsM).—This miscellaneous land type is classified mainly by external features, as stoniness and slope, and the character of its parent material. Widely distributed throughout the county, it includes the strongly sloping and hilly areas of sandstone rockland that, with Rough stony land (Muskingum soil material), comprise the upper third or more of the strongly sloping and steep stony lands between the high sandstone plateaus and the limestone valleys. The slopes vary. In places there are sharp stony breaks with slopes of more than 20 percent, and in others gently sloping to nearly level benches that occur generally in narrow strips not large enough to be outlined to scale on the soil map.

External drainage is good to excessive under forest vegetation and generally rapid to excessive in cleared areas. Internal drainage is good to fair under forest cover and fair to rapid in cleared areas. Pine, oak, hickory, beech, and yellow-popular are common in the present forests. Giant chestnut trees were numerous in the virgin forests.

The surface soil material, which is usually deeper than on the Limestone rockland phases and does not have so many rock outcrops, is composed mainly of sandstone fragments up to boulder size, some crushed or weathered. These fragments accumulated, through colluvial action, on the irregular surface of the limestone formation or



Hollywood silty clay, level phase (0–2% slopes) (Hcv).—Most of this phase occurs a short distance from the base of limestone slopes and extends toward the lower lying first bottoms or low-stream terraces. Individual areas are fairly well distributed over the limestone valleys. Some of the principal areas are near Hollywood, the place for which the soil is named. Others are north of Kyles and Scottsboro, near Pikesville School, and in the southern third and north-central part of the Paint Rock River valley. The parent material was weathered from exposed limestone that contains a high percentage of clay and has been washed from adjoining slopes onto valley floors. In most places the resulting soil is dark in color, but in some places it is somewhat lighter.

Under native forest cover, external drainage is very slow and in places has caused swampiness. In cultivated areas the surface drainage, although somewhat slow, is generally good enough to prevent water from standing on the surface for any length of time. In many cultivated areas external drainage has been artificially improved, mostly by open ditches. Internal drainage is everywhere slow. The natural vegetation consists largely of water-loving hardwoods, but cedar, holly, and pine are common in places.

Profile description:

0 to 8 inches, dark grayish brown or almost black granular waxlike silty clay; sticky and plastic when wet; the surface shiny on smooth cuts;

below limestone slopes. External drainage generally is moderately slow to slow under natural cover and good to somewhat rapid where the soil is cleared and cultivated. Erosion is fairly active in cleared areas where the slope is more than 3 percent, especially if the phase occurs on short breaks bordering fairly well-developed drainageways. Little terracing has been done, but where cropping is continuous all the stronger slopes need terracing to protect them from erosion. Internal drainage is somewhat restricted and slow, but in most places aeration is fairly good.

The profile is generally more uniform in color than in the level phase. The surface soil is dark brown to nearly black. The subsoil is greenish yellow or pale-yellow silty clay, which is massive, sticky, and plastic. Splotches or mottlings of light greenish yellow or reddish brown generally appear at a lower depth. The soil varies mainly in depth of surface soil, as is shown by the undulating or wavy contact between the dark surface soil and the yellowish or brighter subsoil. This contact line can be seen in road cuts, ditches, and gullies. The surface soil ranges from about 4 to 24 inches in depth, but in most places from 10 to 18 inches.

Use and management.—About 70 percent of Hollywood silty clay, undulating phase, is used annually for tilled crops, about 20 percent is in open, partly improved pasture, and about 10 percent is in woodland pasture and forest. The soil is better drained than the level phase and can be worked sooner after rains. A greater acreage is used for crops, and average yields are higher. The soil is high in organic matter and fairly high in plant nutrients. It has a good mellow tilth if cultivated when moderately dry. It is productive in favorable sea-

The surface soil may be fine sandy loam, very fine sandy loam, or silt loam. The color of the subsoil varies from yellowish brown to pale grayish yellow or grayish brown and with increasing depth becomes faintly mottled or somewhat splotched. It is generally friable, but in small spots it is firm and compact.

Use and management.—Holston loam, undulating phase, is used mostly for crops. It has good to excellent workability, responds well to good management, and is suited to practically all locally grown farm crops. Its productivity is good. The most common crops are cotton, corn, hay, oats, sorghum, potatoes, and sweetpotatoes. Home gardens are fairly common. Depending largely on management, cotton yields range from ⅖ to 1 bale or more an acre but generally from ½ to ¾ bale. Corn yields 20 to 40 bushels, the better yields being

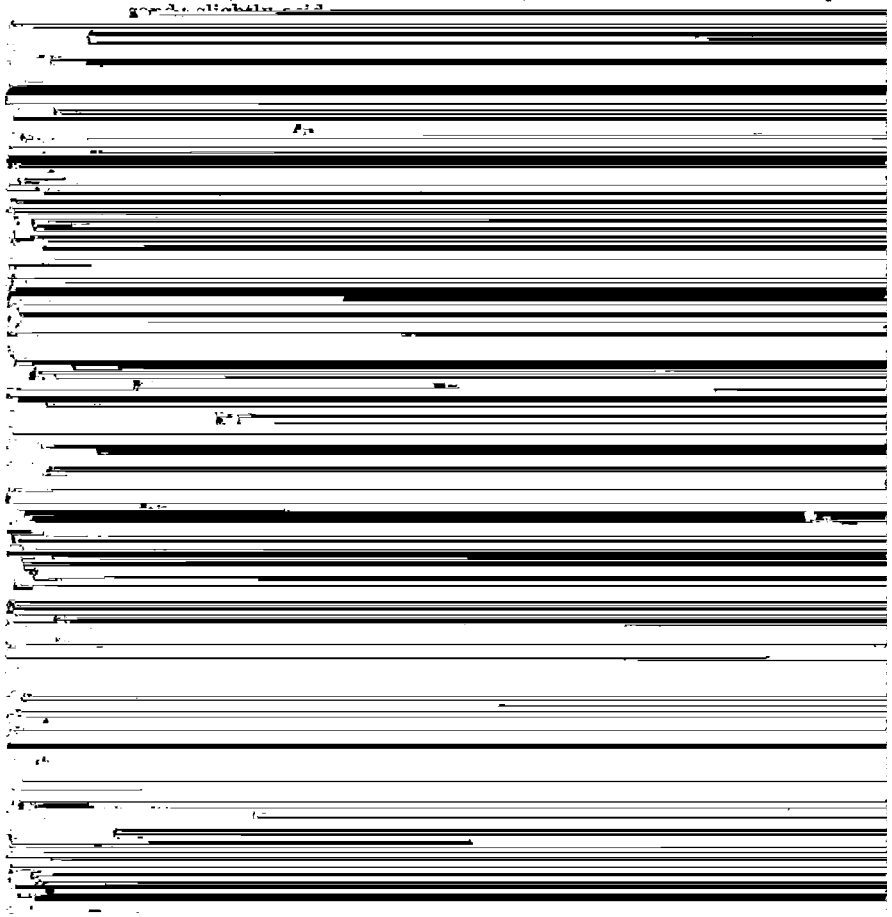
the adjoining soils of the first bottoms, and many of them are on low very gently rounded ridgelike divides in the first bottoms. The undulations in the surface are larger in the first bottoms near the Tennessee River than along other streams in the county.

The alluvial parent material is derived largely from limestone areas, but it contains some materials from sandstone and shale areas distributed to different degrees in all parts of the limestone valleys. The alluvium also contains some micaceous material that originated in igneous rock areas and was deposited along the Tennessee River. Both external and internal drainage are commonly good. In the level or nearly level areas, internal drainage is relatively slow in the lower subsoil or in the parent material. Native vegetation consisted of a thick growth of deciduous hardwoods, vines, and briers, and scattered stands of cedar, pine, and holly.

Profile description:

0 to 7 inches, dark grayish-brown very friable silt loam; easily crushed to a soft mellow mass; slightly acid.

7 to 12 inches, moderate brown silt loam; contains some fine and very fine



Practically no fertilizer is applied for corn and hay. Cotton, which is occasionally grown on some of the higher lying areas, usually receives light applications of a complete fertilizer. Some farmers have reported that corn yields are increased by the use of light applications of a complete fertilizer, especially on the areas seldom flooded.

Jefferson fine sandy loam, undulating phase (2–5% slopes) (JFU).—This phase occupies colluvial foot slopes and fans at the base of mountain slopes. A few areas are in places where drainageways that originate on plateaus or steep rocky slopes issue on high first bottoms. The parent material rolled or washed from sandstone formations and from Muskingum and Hartsells soils.

External drainage is good on the gentle slopes but somewhat rapid on the 4- to 5-percent slopes, and especially so in areas where surface runoff from adjoining higher slopes is rapid. Internal drainage is good, but in some large nearly level colluvial fans it may be somewhat slow in wet periods because seepage water causes a high water table. A large part of the soil is cleared. In uncleared areas the trees are largely deciduous hardwoods and pine, though there are some cedar and holly.

Profile description:

0 to 7 inches, light brownish-gray friable fine sandy loam; contains a fairly large number of water-worn pieces of quartz gravel, small cobbles, and angular sandstone fragments; in virgin or grass-covered areas to a depth of 2 to 3 inches the organic-matter content gives a dark-gray color; very strongly to strongly acid.

7 to 12 inches, brownish-gray to grayish-brown friable fine sandy loam to loam; contains many water-worn pieces of gravel and angular sandstone fragments; very strongly to strongly acid.

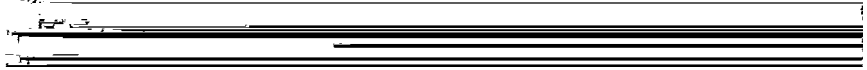
12 to 30 inches, brownish-yellow to grayish-yellow friable fine sandy clay; contains sandstone fragments less than 1 and up to 6 inches or more in diameter; strongly acid.

30 to 48 inches, grayish-yellow to brownish-gray fine sandy clay similar in texture to the overlying layer but slightly splotched or faintly mottled with shades of brown and gray; strongly acid.

This phase varies in texture, in the number and size of sandstone fragments, and in the thickness of the colluvium. Some limestone and chert fragments are present in places. These fragments are few except where colluvial material has been recently accumulated, and then they occur only where rapid-flowing intermittent drainage water deposits new material on the surface. In most places the rock fragments do not interfere with cultivation. In some areas, however, tillage can be improved by removing the larger fragments, and in a few areas cultivation would be hindered greatly if the fragments were not removed.

Accelerated erosion has been active in places but in general it has removed less than 50 percent of the surface soil. On long slopes where the gradient is more than 3 percent, terraces can be used effectively in reducing loss of soil material and conserving moisture.

Use and management.—Jefferson fine sandy loam, undulating phase, is desirable for general farming. It has good workability but is moderately low in plant nutrients. It absorbs moisture well, has good moisture-holding capacity, is responsive to good manage-



for pasture. In general, it is well suited to cotton. A few of the lower lying nearly level areas on colluvial fans are best suited to corn, soybeans, cowpeas, and other hay crops. With good management general farm crops produce well, cotton yielding about ⅘ bale and corn about 40 bushels an acre.

Jefferson fine sandy loam, eroded undulating phase (2–5% slopes) (JFE).—This phase is widely distributed over various parts of the limestone valleys from Paint Rock River valley in the western part of the county to the tract east of the Tennessee River in the northeastern part. The soil is similar to the undulating phase in physical characteristics, position, and surface relief, but it has lost more surface soil and subsurface soil through accelerated erosion. The colluvial parent material is derived mainly from material of sandstone formations or from soil formed from weathered sandstone material. In general it is similar to the parent material of the other members of the series and that of the Allen soils. External drainage is good to excellent under native vegetation but somewhat rapid in cultivated fields where slopes are 4 to 5 percent. Internal drainage is generally good.

Use and management.—Jefferson fine sandy loam, eroded undulating phase, has at some time been cultivated; and at present most areas are used annually for field crops. Workability, including tilth, has been impaired, moisture absorption has been reduced, and susceptibility of the soil to washing has been increased by the loss of the friable surface soil through erosion. Most areas have lost 50 to 75 percent or more of the original surface soil through accelerated erosion, and a few have lost practically all the surface and subsurface soil. The productivity also has been reduced, but in most places the subsoil is fairly friable. Where erosion is reduced by properly built terraces, the

and a small part is idle or in forest. Little if any is in permanent pasture that has been improved by the use of amendments and proper seed mixtures.

This phase is responsive to good management, however, and when properly terraced to conserve moisture and prevent loss of soil material through erosion, it produces good yields of cotton. Corn does fairly well on terraced areas when it follows a winter legume. Depending on the season and management, cotton, the principal crop, yields ⅕ to ¾ bale an acre, and corn yields 8 to 35 bushels. Soybeans, cowpeas

fairly active and has removed one-half to three-fourths or more of the virgin surface soil. The present surface soil consists largely of subsurface soil and subsoil materials mixed by tillage with the remaining original surface soil. This surface layer is mostly brownish gray and ranges from a firm sandy loam to a generally friable sandy clay loam. In some places, however, it may be somewhat plastic. Internal drainage is commonly good but may be somewhat rapid in places.

Use and management.—Jefferson-Allen loams, eroded rolling phases, are difficult to work, largely because of the stony slopes, but their sandy

External drainage is rapid to excessive, and internal drainage is generally good to rapid. Sheet and shallow gully erosion have been active on the cleared land, removing about half to more than three-fourths of the original surface soil. In places shallow gully erosion has removed even part of the subsoil. A few deep gullies have formed. Some small severely gullied areas are designated on the soil map by symbol.

The present surface soil consists largely of subsurface soil and subsoil material mixed with the remaining original surface soil by tillage. The color, which varies from place to place, is brownish gray to reddish brown. The texture ranges from fine sandy loam in places where much of the original surface soil remains to fine sandy clay in places where the present surface soil consists mainly of subsoil material. Sandstone fragments, ranging in diameter from less than 3 to more than 8 inches, are common on the surface and throughout the soil. Chert fragments are generally present and in places are numerous. Limestone fragments or outcrops are common in some areas.

Use and management.—Jefferson-Allen loams, eroded hilly phases, are difficult to work, largely because of the strong slopes and rock fragments. Under virgin conditions this complex had fairly good moisture-absorption and good moisture-holding qualities, but when cleared and subjected to accelerated erosion it lost some of its ability to absorb moisture. Its best use is for pasture and forest; most of it

Use and management.—The slopes are so steep and the workability and conservability of Jefferson-Allen loams, steep phases, so difficult that the use suitability is restricted mainly to forest. A small part, however, could be used for permanent pasture and a few small more favorable areas for crops. Most of these phases are forested mainly with deciduous hardwoods, but in places pines are fairly common. There are some cedars, especially in areas that contain limestone bedrock outcrops. The forest has been cut over from time to time for commercial products or for wood for fuel, fence posts, rails, and other farm and domestic purposes.

Jefferson-Allen loams, severely eroded steep phases (25–35% slopes) (JAs).—This complex is similar to the one of steep phases in surface relief and soil characteristics, but unlike those phases it has lost most of the original surface and subsurface soil through sheet and shallow gully erosion. The subsoil is exposed at the surface in many places, and a few deep gullies have formed. Long deep gullies and severely gullied areas are designated on the soil map by symbol. Plowing is nearly everywhere done in the subsoil. External drainage is excessive; internal drainage, rapid.

Use and management.—Most of Jefferson-Allen loams, severely eroded steep phases, at some time has been used for cultivated crops and pasture. Largely because of the serious erosion that has taken

few inches to more than 3 feet above the surface and in places form perpendicular walls or escarpments. In general, however, the outcrops project 10 to 36 inches above the surface at one side and lie even with it at the other. In some places only a thin mantle of soil covers the limestone.

Use and management.—Nearly all of Limestone rockland (hilly) is in forest (pl. 7, *A*). Some areas are in woodland pasture, but only few are cleared. A few benches have been cleared and used for subsistence crops by tilling between the rocks. The main tree is redcedar, although redbud is common. Extensive areas are covered with deciduous hardwoods and scattered cedars. Large chestnut, oak, beech, persimmon, cedar, and yellow-poplar trees were common in the native vegetation.

This land type is productive and probably well supplied with most plant nutrients, but poor physical characteristics reduce its productivity and the rocky surface excludes its use for cultivation. Under present conditions its best use is forest, but suitably located areas with relatively gentle slopes and a small part of the surface occupied by rock outcrops could be utilized for improved open pasture.

Rock-crushing plants have operated or are in operation in many places. They crush limestone rock for road gravel, agricultural lime, and other commercial uses.

Limestone rockland (rough) (25%+slopes) (LR).—Areas of this land type occur in wide nearly continuous belts that include most of the lower two-thirds of the rocky slopes lying between the sandstone plateaus and the limestone valleys. In many places in the limestone valleys the land occupies areas where ridges capped with sandstone have lost their capping. Like Rough stony land (Muskingum soil material), the land type includes the escarpments and most of the benches, sharp ridges, and other surface features between the rim of the sandstone plateaus and the floor of the limestone valleys. It also occurs on steep limestone mountains and hills in the limestone valleys. It is characterized as rough land and has greater variation in slope, limestone outcrops, drainage, and character of soil material among the outcrops than Limestone rockland (hilly) or Rolling stony land (Colbert soil material). In general characteristics, it is similar to Limestone rockland (hilly) except that the slopes are steeper.

The soil material among the rocks consists of residue from limestone weathered in place and wash from higher slopes that has lodged in holes and crevices of the limestone. Some of the material is derived from weathered shale. External drainage is very rapid to excessive except in areas on the included nearly level benches, where it is moderately slow to slow. Internal drainage is generally fair to good, but it is slow in areas affected by seepage water from higher lying areas. Small to large limestone sinks that receive much runoff and seepage water and discharge it into underground channels are common.

Use and management.—All of Limestone rockland (rough) is covered with forest consisting largely of cedar on the lower slopes and deciduous hardwoods on the upper slopes and benches. A mixture of cedar and deciduous hardwoods, however, predominates in many areas. In a few areas there is a fairly solid stand of pine and in other small areas just a scattering of pine. On the higher slopes the soil supports a greater proportion of deciduous hardwood in fairly solid stands than

Limestone rockland (hilly) or Rolling stony land (Colbert soil material). Most of the forest has been cut over at various times. In many areas lumbering is difficult, but most of the smoother ridge tops and nearly level benches facilitate the removal of logs to sawmills. In some places it is possible to use the land for woodland pasture.

Lindside silt loam (0–2% slopes) (LL).—This soil occupies level to very gently undulating areas on intermediately drained broad nearly level flood plains of creeks and rivers in the limestone valleys. The parent material consists mostly of relatively recent deposits washed from soils of the uplands and underlain by limestone or wash directly from weathered limestone, sandstone, and shale. In places the color comes from the soils from which the material has washed, but in most areas it appears to be largely due to soil development.

The native vegetation consisted largely of deciduous hardwoods. Several kinds of oaks and hickory, sweetgum, yellow-poplar, beech, dogwood, and ironwood are the principal trees. Reeds, other tall grasses, vines, and other underbrush are common.

External drainage is commonly fair to good, but the soil is subject to occasional overflow from adjacent streams. Internal drainage is good in the surface soil, usually good in the upper subsoil, and slow in the lower subsoil. The soil is moderately open and allows lateral internal drainage into creek channels or other fairly well established drain channels. The surface soil and upper part of the subsoil are moderately well to well drained a relatively short time after floodwaters subside.

Profile description:

0 to 8 inches, dark grayish-brown friable silt loam; relatively uniform in

is not usually used. Corn yields 35 to 50 bushels, lespedeza from 1 to 1½ tons of hay, and soybeans from 1½ to 2½ tons of hay an acre. Cotton is also grown in some areas, yields ranging from ⅖ to nearly 1 bale an acre. The soil is used to some extent for the production of sorghum for sirup. The quality of the sirup is said to be better than that obtained on some of the darker colored soils, but not equal to that obtained on the mountains. The soil is exceptionally well suited to pasture.

Lindside silty clay loam (0–2% slopes) (LD).—This first-bottom soil is similar to Lindside silt loam in color and other profile characteristics, although it has finer texture, slightly darker surface soil, and grayer subsoil. The texture of the surface soil ranges from silty clay loam to silty clay, and the texture of the subsoil generally is silty clay. The soil occupies wide relatively level stream bottoms, where it is closely associated with other Lindside soils and with Egam and Melvin soils. In most places it occurs in the lower half of creek or river valleys or at a short distance from the main stream channels where floodwaters are slow enough to deposit fine-textured material after having deposited the coarser material in the upper valleys or nearer the stream channels. No areas, however, are in places occupied by temporary slack water. External drainage is fair, and water moves off soon after the soil has been flooded or heavy rains have stopped. Internal drainage is fairly good in the surface soil and upper subsoil but slow in the lower subsoil.

Use and management.—About 65 percent of Lindside silty clay loam is cleared and used for crops and pasture. The principal crops are corn and soybeans, although in wet years their use is somewhat hazardous and the soil is best suited to pasture. In seasons of favorable moisture or in relatively dry seasons, however, the soil seems to produce higher yields of corn and soybean hay than Lindside silt loam, although over a period of many years the average yields may be somewhat lower. Damage to field crops from overflows may be slightly greater than on the silt loam. Winter oats grow well in areas protected by artificial means from overflow. Only areas known to be relatively free from prolonged overflows are safe for winter grain. The soil is exceptionally well suited to permanent pasture.

Lindside silty clay (0–2% slopes) (LE).—This soil occupies relatively level areas on broad divides in first bottoms in the south-central

to work during wet seasons and that crop yields in unfavorable seasons are low. The average yields are lower than on the silt loam.

Under management that includes the use of proper amendments and pasture mixtures, this soil produces excellent grazing. It may be advisable to use more of the soil for improved permanent pasture and less for field crops, so as to offset losses to the field crops grown in wet years.

Melvin silt loam (0–2% slopes) (ML).—This soil occurs in the upper parts of valleys and coves and in fairly narrow strips adjoining or close to the main channels in broad nearly level bottoms farther down the limestone valleys. Surface relief is level or nearly level, and external drainage is commonly slow. In many of the larger areas, however, shallow drainageways extend into the slightly higher areas and provide fair surface drainage, except in very wet seasons. Under optimum moisture conditions this soil has a mellow surface soil of fair to good moisture-absorption qualities, fair workability, and no erosion control problem. For best results, however, the slow internal drainage must be improved by ditches or by tiling, even for pasture. Internal drainage has been improved in some areas by tile drains and in others by open lateral ditches.

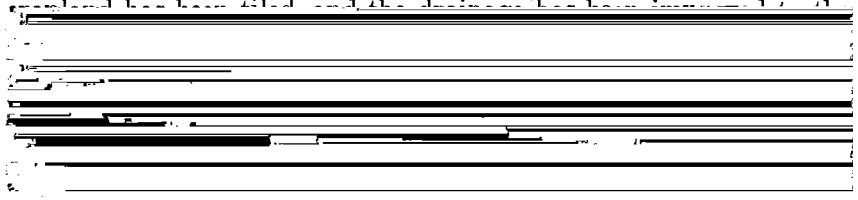
Profile description:

0 to 8 inches, pale-gray to light brownish-gray friable silt loam faintly mottled with gray and brown; slightly acid.
8 to 24 inches, light brownish-gray to grayish-yellow friable silty clay loam faintly to highly mottled with gray, brown, yellow, and reddish brown; generally more highly mottled, heavier, and more plastic and sticky with increasing depth; slightly to medium acid.
24 to 40 inches, gray heavy plastic silty clay; mottled with reddish brown and yellow; medium acid.

The color varies from dark brownish gray to ash gray in the surface soil and from yellowish brown to medium gray in the subsoil. Although the lower subsoil is generally heavy, sticky, and plastic, it is moderately heavy and moderately friable in some areas.

Use and management.—About 25 to 35 percent of Melvin silt loam has been cleared for crops, and about 20 to 25 percent for permanent pasture. The rest is in forest and is used both for forest products and woodland pasture. Natural vegetation consists largely of water and willow oaks, elm, sweetgum, blackgum, ash, and other water-tolerant trees in the wetter areas and various kinds of oaks and hickory, beech, persimmon, and some pine, cedar, and holly on the slightly higher areas.

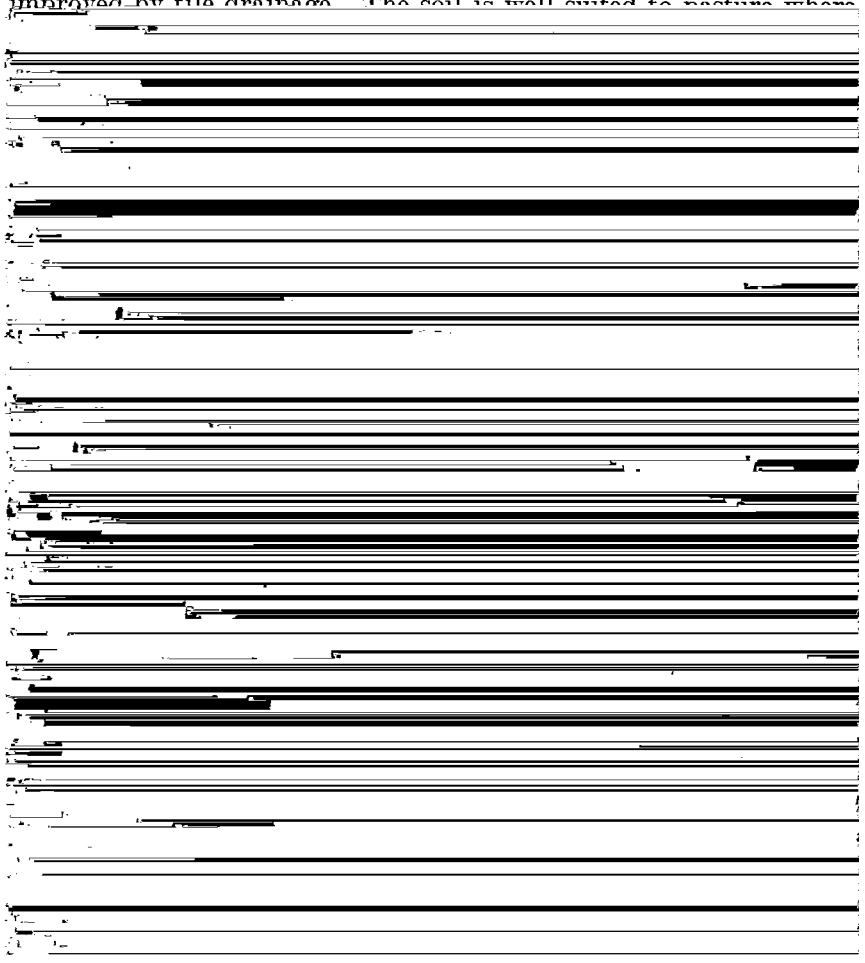
The soil is probably best suited to pasture. Good improved permanent pasture can be established by the use of soil amendments and by seeding a suitable pasture mixture. For better pastures most areas require artificial drainage. The most common crops grown are grain sorghum, soybeans, and sorghum or corn. A small part of the



with Melvin silt loam and Egam and Lindside soils. The larger areas are in the wide nearly level first bottoms common on the stream flood plains in the lower half of the Paint Rock River valley. The surface relief is nearly level. Shallow drainageways extend into or across the areas.

In profile development and color the soil is similar to Melvin silt loam. In general, however, its areas are somewhat larger, the texture more uniform, and surface relief more uniformly nearly level. External drainage is a little slower than in areas of the silt loam, but the difference is not great. Internal drainage is slow and very similar to that of the silt loam. The vegetation is the same on both soils. The parent material is similar to that of the Lindside soils.

Use and management.—Probably not more than 25 to 35 percent of the cleared part of Melvin silty clay loam is cultivated. The main crops are corn, soybeans, and sorghum. The yields in favorable years are as good as on Melvin silt loam, but in wet years they are very low. Corn is the main crop in a large area south of Woodville that has been improved by tile drainage. The soil is well suited to pasture where



pine is common in cut-over areas and in some abandoned fields. There are many vines and various kinds of underbrush.

Use and management.—Monongahela loam, undulating phase, has good tilth and fair to good workability in other respects. It has fair to good moisture absorption in the surface soil, but movement of moisture in the subsoil is restricted by a tight nearly impervious layer in the lower part. Internal drainage, however, is somewhat better than in the level phase.

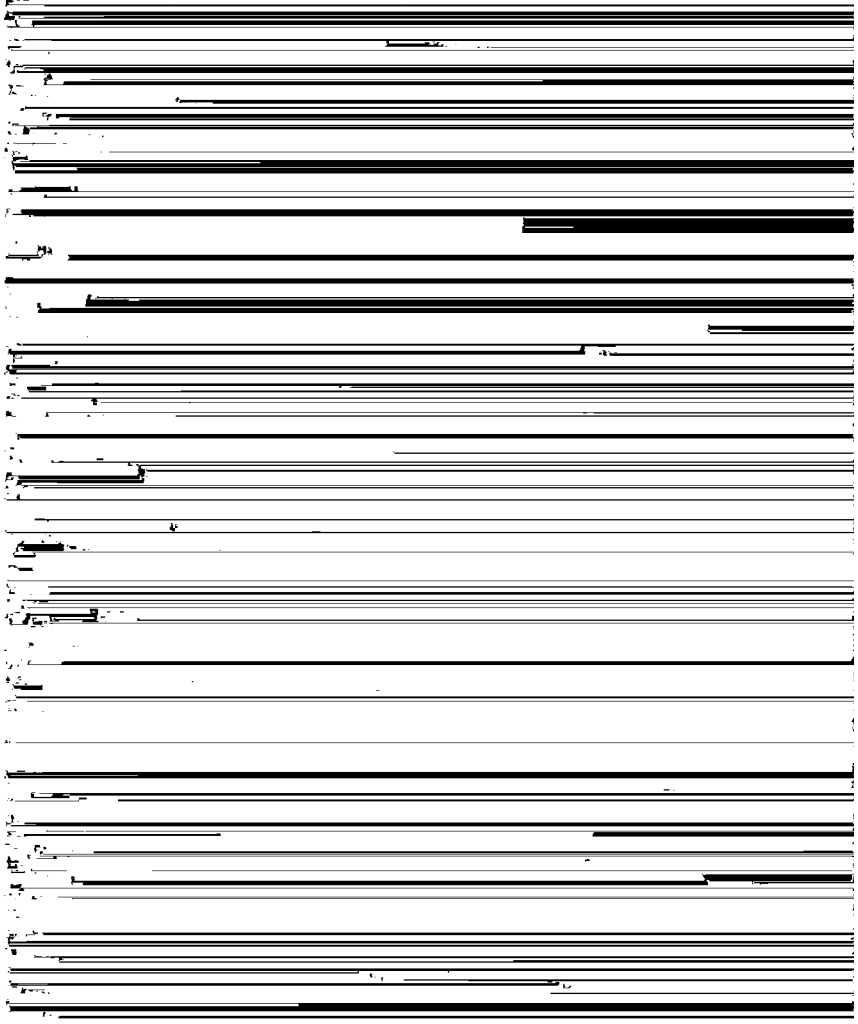
Most of this phase is cleared and is used for general farm crops, chiefly cotton, corn, and hay. In uncleared areas the trees are principally deciduous hardwoods. Cotton is planted much more commonly than on the level phase. Cotton yields ⅓ to ¾ bale an acre under management that includes application of 200 to 350 pounds of 6–8–4 or other high-grade fertilizer. Corn yields 10 to 25 bushels an acre under management that includes side dressing with 150 to 225 pounds of nitrate of soda an acre. Lespedeza produces ½ to 1 ton of hay an acre; and soybeans, 1 to 1½ tons of hay. Winter legumes grow fairly well on this soil, which is better suited to them than the level phase largely because of its better surface drainage.

The productivity of the soil can be improved by properly terracing the stronger slopes, by applying needed soil amendments, and by growing winter legumes or other green manures to increase the organic content. In some places this phase is in close association with more

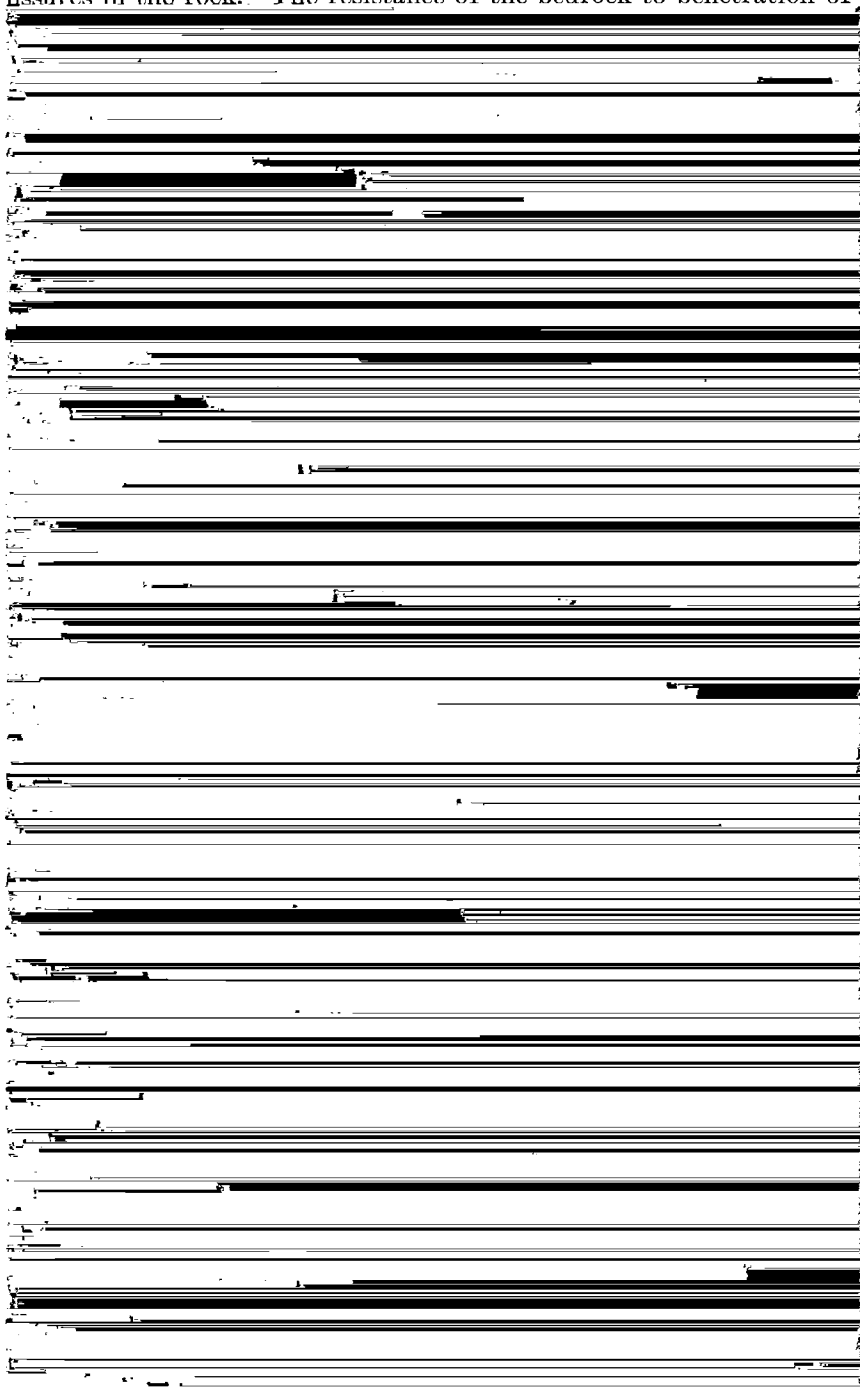
oaks predominating, but there are some pines, especially Virginia pine or scrub pine. Shortleaf and old-field pines are common in abandoned fields and areas that have been cut over for timber. A small part is used for crops, mainly corn, cowpeas, soybeans, and lespedeza and to a lesser extent, cotton.

Chiefly because of the strong slope, low fertility, shallow depth to bedrock, and, in places, stony nature, this soil is very poorly suited to crops and poorly suited to pasture. Nonetheless, most areas properly fertilized, limed, and seeded afford fairly good grazing, especially early in spring. The shallower more exposed parts are not productive of good grass, even under a relatively high level of management, and are best suited to forest. Some of the most favorably situated areas are suitable for apple, peach, and plum orchards.

Muskingum fine sandy loam, eroded hilly phase (10–20% slopes) (MFH).—This phase occurs in small areas well distributed over the sandstone plateaus. It is similar to the hilly phase, except that half



penetrates to the bedrock except along bedding planes and through fissures in the rock. The resistance of the bedrock to penetration of



14 to 30 inches, pale brownish-gray to bluish-gray silty clay; mottled or splotched with yellow, brown, reddish brown, and nearly black; fairly uniform throughout but usually heavier and more sticky and plastic with depth; medium acid.

The soil varies considerably in color and in the character of the parent material and its depth to other material. The parent material is generally friable throughout, but the material beneath it is tight, plastic, and sticky.

Use and management.—Most of Ooltewah silt loam has been cleared of brush, trees, and briers and drained by open ditches. The soil has no true native vegetation, because the parent material accumulated after accelerated erosion became active in the surrounding higher lying soils. The trees and most of the other vegetation are native to the underlying soil that was covered by recent colluvial material. The soil is used for corn and for soybeans and other hay and forage crops. Small parts are used for pasture; others are not cleared.

When adequately drained, the soil is productive. The slow external and internal drainage, however, delay its warming in spring. Flooding or ponding during heavy rains may damage growing crops. Owing largely to these unfavorable features, crop yields have a wider range than on the Abernathy soils. Corn may fail in very wet years but yields 50 bushels or more an acre in very favorable years. Corn is not fertilized. Soybeans yield ½ to 2½ tons of hay an acre.

Where the soil has been thoroughly drained artificially and is protected from flooding, crop yields average nearly as much as on Abernathy silt loam, level phase. The soil can be improved so that it will provide excellent grazing. Small areas within permanent pastures can be used to best advantage for pasture.

Philo-Atkins silt loams (0–2% slopes) (PA).—This level or nearly level complex of imperfectly and poorly drained soils occurs in narrow first bottoms along streams in the sandstone plateaus. The soils of this complex are similar to the Sturkie and Prader soils in the limestone valleys. They are derived from alluvium that consists of material washed from areas of interbedded sandstone and shale. External drainage is slow to very slow, and internal drainage, fair to poor.

Profile description of the Philo soil:

0 to 3 inches, dark brownish-gray to grayish-brown friable very fine sandy loam; contains considerable organic matter; very acid.
3 to 8 inches, grayish-yellow to grayish-brown friable very fine sandy loam.
8 to 18 inches, yellowish-brown friable silty clay loam to silty clay; very strongly acid.
18 to 48 inches, faintly to intensely mottled yellow, light-brown, and gray friable fine sandy clay to very fine sandy clay that is grayer with depth.

Variations are common. The texture of the surface soil varies from fine sandy loam to silty clay loam, but it usually is fine sandy loam to very fine sandy loam. The parent material varies from old colluvium to very recent alluvium.

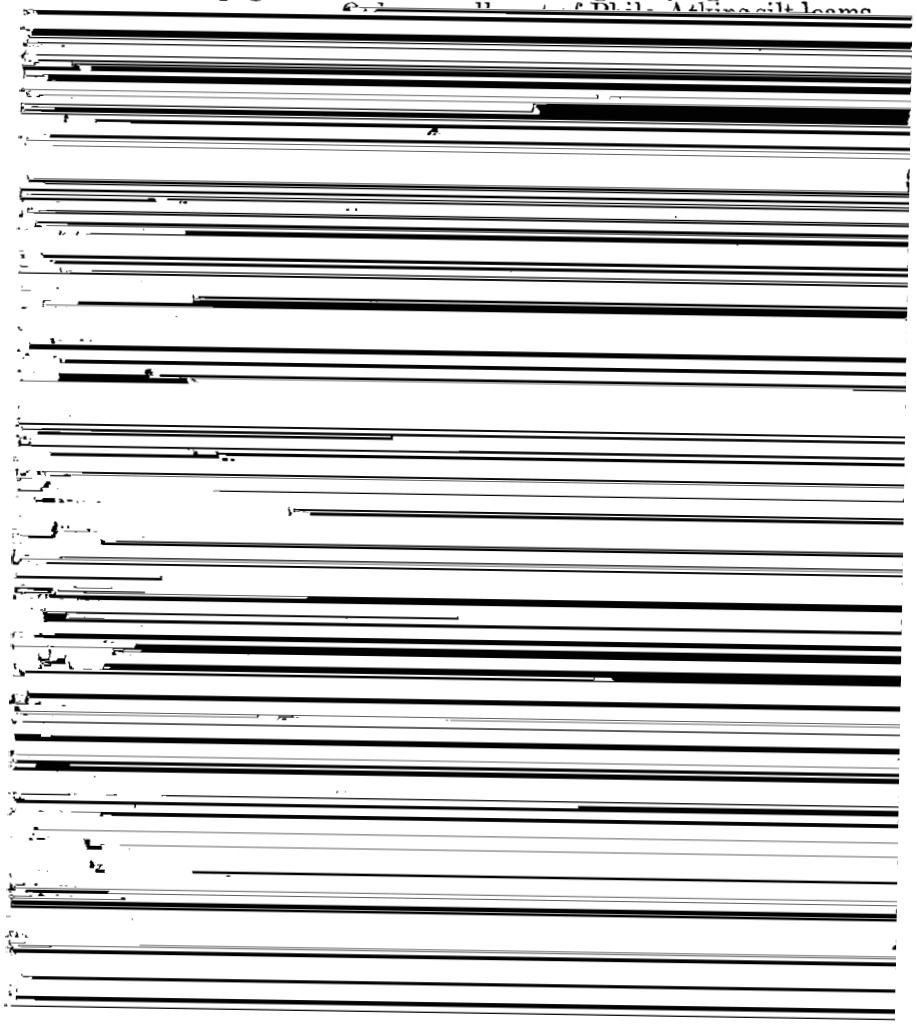
Profile description of the Atkins soil:

0 to 2 inches, very dark or nearly black silt loam; high organic-matter content; very strongly acid.
2 to 6 inches, gray moderately friable to moderately sticky silty clay loam; in places highly leached and nearly ash gray, but generally mottled with brown, yellow, reddish brown, and bluish gray; very strongly acid.

6 to 24 inches, gray heavy silty clay mottled with reddish brown, yellow, and bluish gray; sticky and plastic; very strongly acid.

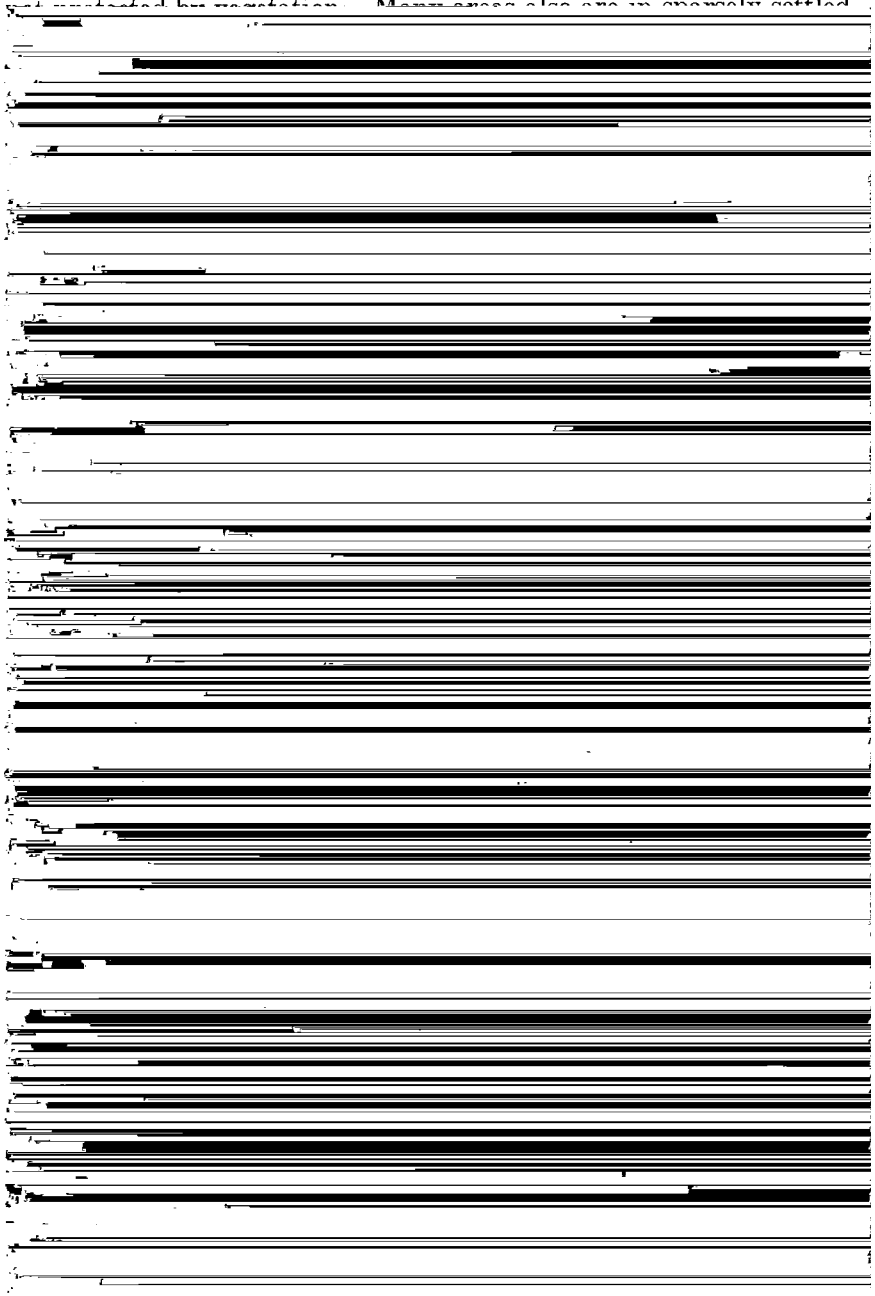
In some places the surface soil is fine sandy loam or very fine sandy loam. The parent material varies considerably from place to place.

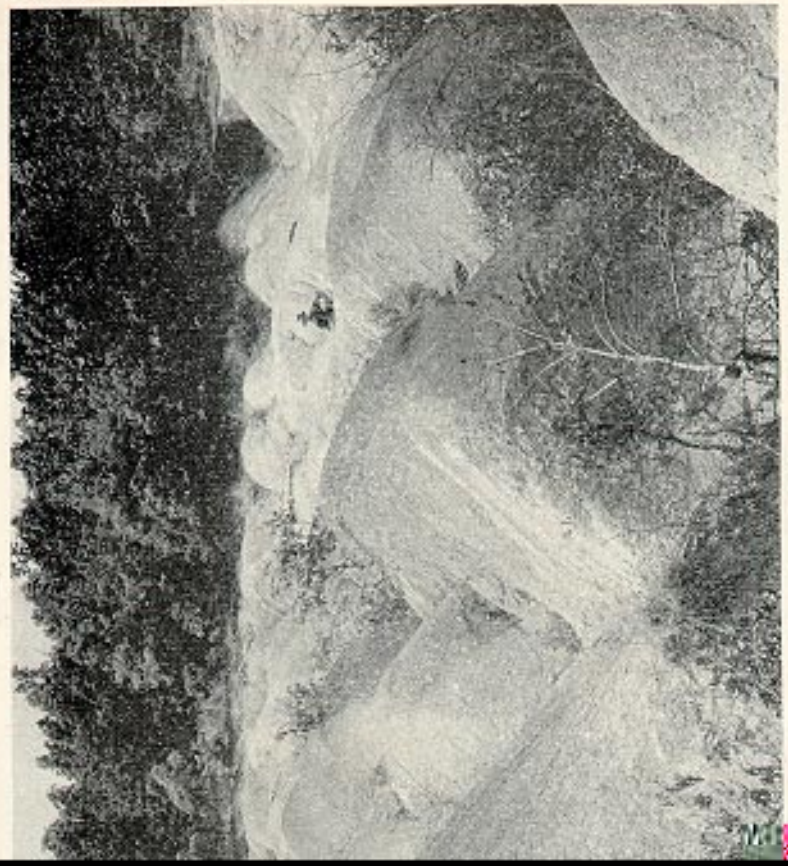
As mapped this complex includes a relatively large total acreage of Lickdale silt loam occurring in areas too small to map separately. This included soil occupies drainheads on Sand Mountain and other mountains. It is characterized by a dark-gray to pale-gray or pale yellowish-gray surface soil and mottled yellow, gray, bluish-gray, and reddish-brown subsoil. In forested areas it varies from ash gray to yellowish gray because there are different quantities of organic matter in the upper 2 to 3 inches. In texture it varies from fine sandy loam to silt loam. The depth of the soil to rock ranges from less than 10 to about 48 inches. Rock outcrops occur in places. The soil is subject to considerable seepage water that issues from higher lying soils.



the relatively old material the soil has a loose friable surface soil and a heavy somewhat plastic subsoil.

Use and management.—The greater part of Pope fine sandy loam has not been cleared for cultivation, because it occurs in narrow first bottoms that tend to wash badly during floods if they are cleared and





nd (Dewey, Cumberland, and Colbert soil materials).

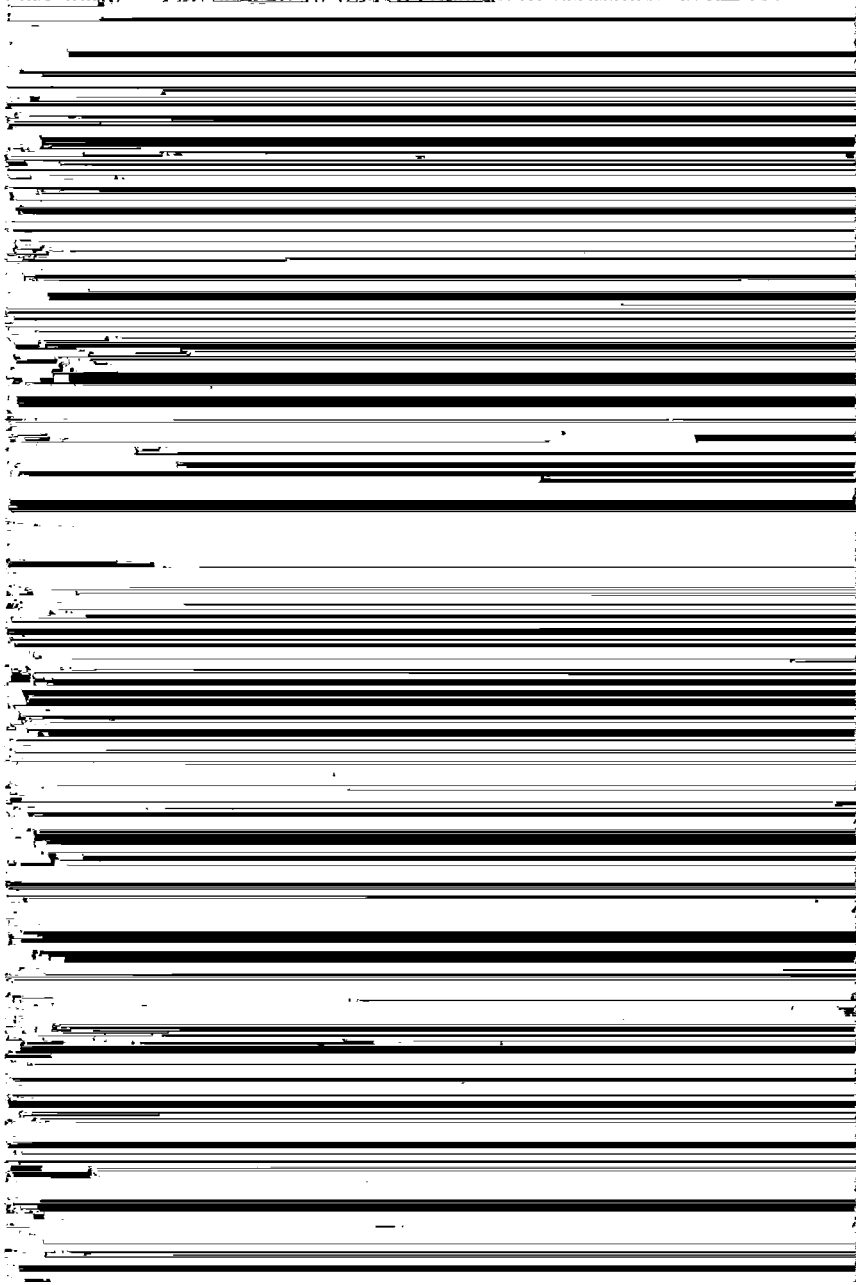
low. Pasture does fairly well, but soil and moisture, however, are difficult to conserve even when the land is in pasture. Under present economic conditions the soil probably can be used best for forest.

Pottsville loam, eroded hilly phase (10–20% slopes) (PLH).—This soil is closely associated with the hilly phase and resembles that phase in surface relief, position, and character of parent material.

8 to 24 inches, pale-gray to grayish-yellow moderately friable very fine sandy clay loam to silty clay faintly to intensely mottled with brown, reddish brown, yellow, and gray; slightly acid.

24 to 36 inches, bluish-gray heavy plastic sticky clay mottled with brown, reddish brown, and yellow; slightly acid.

The texture of the surface soil ranges from light fine sandy loam to silty clay loam. The subsoil in places consists of stratified silty clay loam



them on relatively gentle slopes at the base of steep stony slopes but a few on isolated knolls and on broad moderately rounded ridge tops in tracts of steep stony land. Although surface relief is predominantly rolling, there are some sharp breaks consisting largely of exposed bedrock and some small nearly level areas lying immediately above these sharp breaks.

The very heavy, sticky, and plastic soil among the rocks is Colbert soil material. The surface soil is dark olive drab to yellowish olive. The upper subsoil is yellow, and in the lower part it is mottled yellow, gray, red, and reddish brown. External drainage is rapid. Internal drainage is slow to very slow, largely because of the tight heavy soil material and the shallow depth to bedrock.

Use and management.—Practically all of Rolling stony land (Colbert soil material) is in cut-over forest. The trees are numerous in some places and few in others. They are mainly cedar but include redbud, willow, plum, and others. Some areas are used for woodland pasture and some for partly cleared pasture. In the partly cleared areas the pasture plants are probably volunteer and consist of lespedeza, hop clover, Dallis grass, and other common pasture plants.

The soil is productive, especially of grasses and clovers, but is too stony for cultivated crops. In general, its best use is for woodland pasture and trees. Some areas are suitable for open pasture, but very little can be done to improve the land even for pasture. The less stony areas could be cleared of trees and underbrush so that clovers and grasses might have more favorable growing conditions.

Rolling stony land (Muskingum soil material) (5–10% slopes) (RLM).—This land type consists of areas in nearly level saddles and on small plateaulike knobs and gentle to relatively strong slopes on the sandstone plateaus. It is associated with the shallow phases of Hartsells soils and with Crossville loam. Sandstone outcrops and boulders occupy much of the surface. The outcrops are nearly even with the surface in some places and project above it in others. The soil among the rocks consists of brown to light-brown friable earthy material derived from weathered sandstone mixed in some places with weathered shale.

The relief is predominantly rolling, although in some areas it is undulating. External drainage is fair to rapid, and internal drainage is good to fair in most areas but is slow where bedrock is near the surface. In wet seasons seepage water from the slopes generally makes the shallow areas wet, but in warm dry weather these areas are droughty.

Use and management.—Most of Rolling stony land (Muskingum soil material) is in forest. Natural vegetation consists largely of deciduous hardwoods. Pines are fairly common, especially on cut-over areas and on formerly cleared areas now grown up with forest vegetation. Scrub pine or Virginia pine was native to many of the areas that have shallow soil. Some of the soil is used for woodland pasture and some for open permanent pasture. Some small less stony areas are planted to home gardens, corn, and potatoes, but nearly everywhere the land is too stony for tilled crops. Selected areas can be improved for open pasture by the use of lime and phosphate or basic slag and by seeding with suitable pasture plants.

Rough gullied land (Dewey, Cumberland, and Colbert soil materials) (5–25% slopes) (RgD).—This rolling and hilly land type includes rough gullied areas occurring mostly on foot slopes in the red serrated hills along the Tennessee River. Some areas are widely distributed in other parts of the county and are associated with a great number of different soils in the limestone valleys and coves. Nevertheless, most areas were Dewey, Cumberland, and Colbert soils before accelerated erosion destroyed their profiles. The parent material is

in which the soil material exposed at the surface is almost wholly from limestone. Rough stony land (Muskingum soil material) consists largely of colluvial accumulations of sandstone material on limestone bedrock. Between the sandstone fragments is soil material derived mostly from sandstone. In places there are limestone outcrops, but the soil material among these outcrops is derived from sandstone colluvial material. The areas occupied by sandstone

small and their stands light compared with the large trees and heavy timber stands the early settlers found. Considerable timber for lumber and other forest products, however, is taken annually from these areas.

This land is not suited to cultivation, because of the rocky surface and steep slopes. A few small areas of less stony surface and milder slope have been cleared for home gardens, orchards, or small plots of corn or potatoes. These areas are included because their small size does not justify their separation on the soil map. However, they are not representative of the land type as a whole.

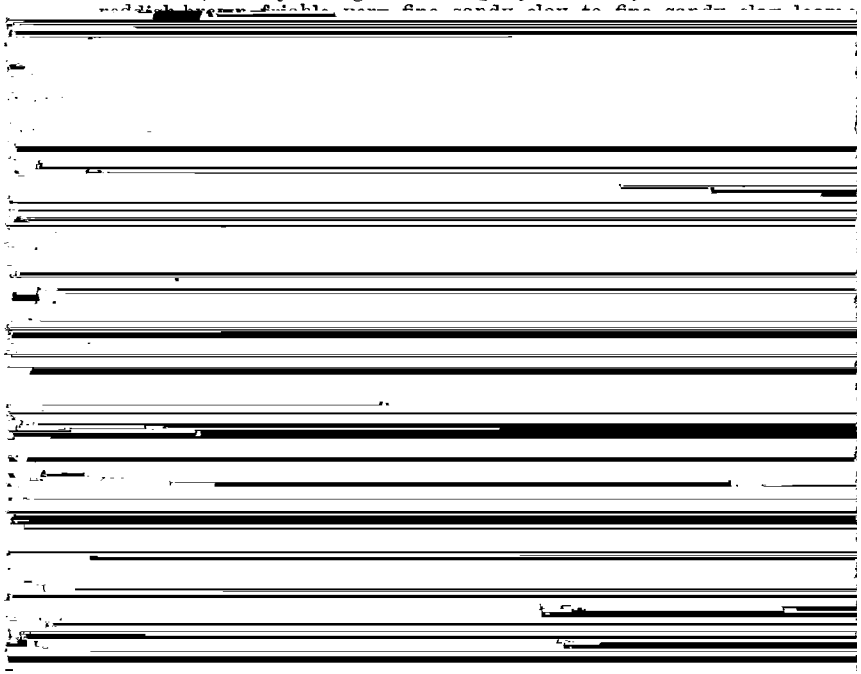
Sequatchie fine sandy loam, undulating phase (2–5% slopes) (SFU).—This phase is fairly well distributed over moderately low to intermediate stream terraces throughout the limestone valleys. Many areas are in the valleys south of Scottsboro, near Lim Rock and Rash, north of Woodville, and west of Bridgeport and Stevenson. The alluvial parent material consists largely of sandstone material and to some extent limestone and shale materials.

Accelerated erosion is fairly active in most of the areas and has removed a fourth to half or more of the surface soil. External and internal drainage are generally good. External drainage, however, is slightly rapid in places, especially where sheet and shallow gully erosion have removed half or more of the surface soil. Severely sheet eroded or shallow gullied areas are designated on the soil map by symbol. The native vegetation is similar to that of other well-drained soils in the limestone valleys.

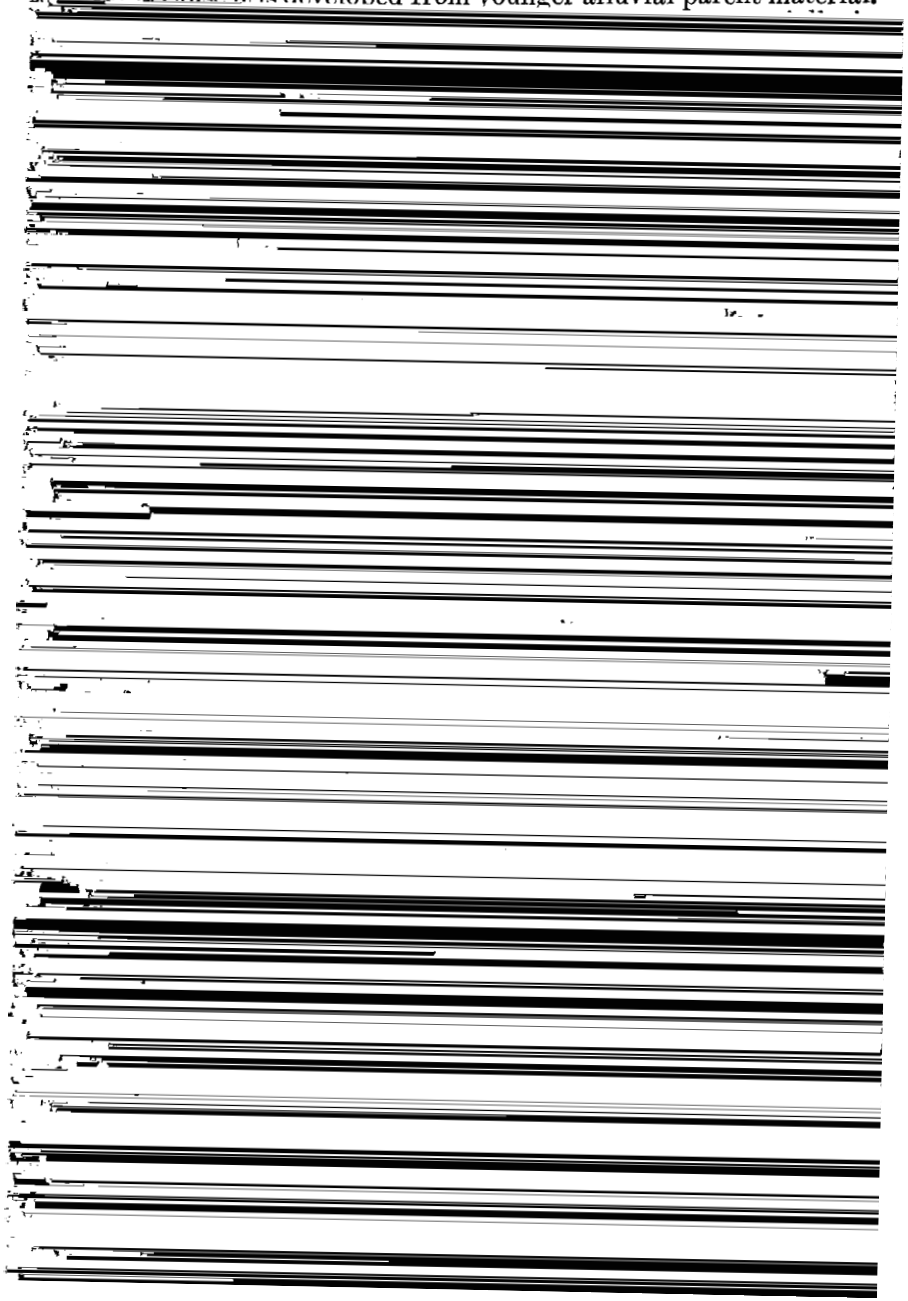
Profile description:

0 to 9 inches, dark grayish-brown to brownish-gray friable loose fine sandy loam to very fine sandy loam; strongly to medium acid.

9 to 14 inches, faintly variegated or slightly mottled yellowish brown and [illegible] friable, [illegible] fine sandy clay to fine sandy clay loam;

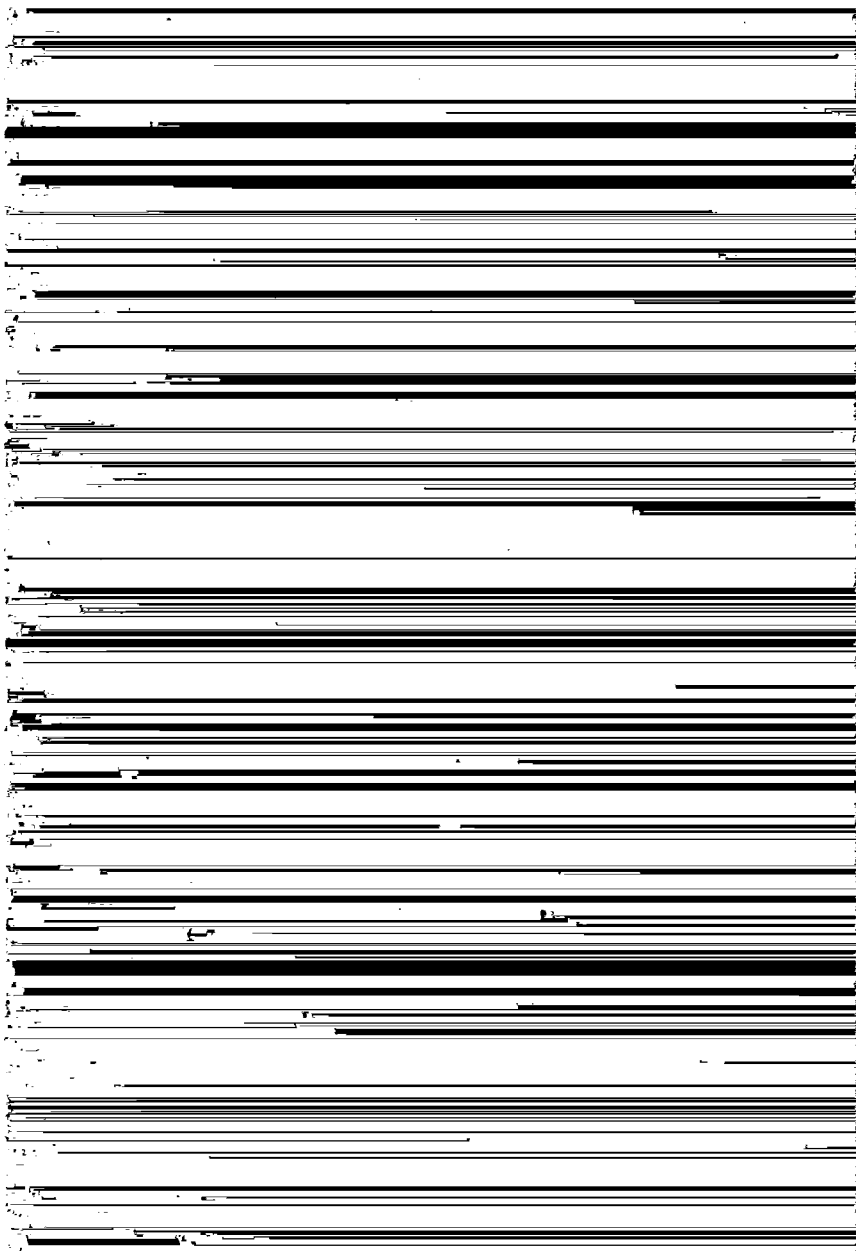


Sequatchie fine sandy loam, level phase (0–2% slopes) (SFV).—This phase occurs mainly on low stream terraces and occupies slightly higher areas than the closely associated soils in the first bottoms. It is similar to the undulating phase in most profile characteristics but differs in having level or nearly level surface relief and in being younger because it is developed from younger alluvial parent material.



essary for growing fair to good pasture is to keep the better soil areas cleared of briers and underbrush. Some forest cover must be kept on the land to hold back swift floodwater, otherwise the soil soon washes away.

Sturkie fine sandy loam (0–2% slopes) (St).—This level to nearly level soil occupies areas in the relatively wide first bottoms in all



definite surface and subsoil layers. The lower lying or younger parts resemble Abernathy silt loam, undulating phase, in some respects, and the higher lying parts, Hermitage silty clay loam, eroded rolling phase. This soil, however, differs from the Abernathy and Hermitage soils in having a decidedly finer texture and a firmer more plastic consistence.

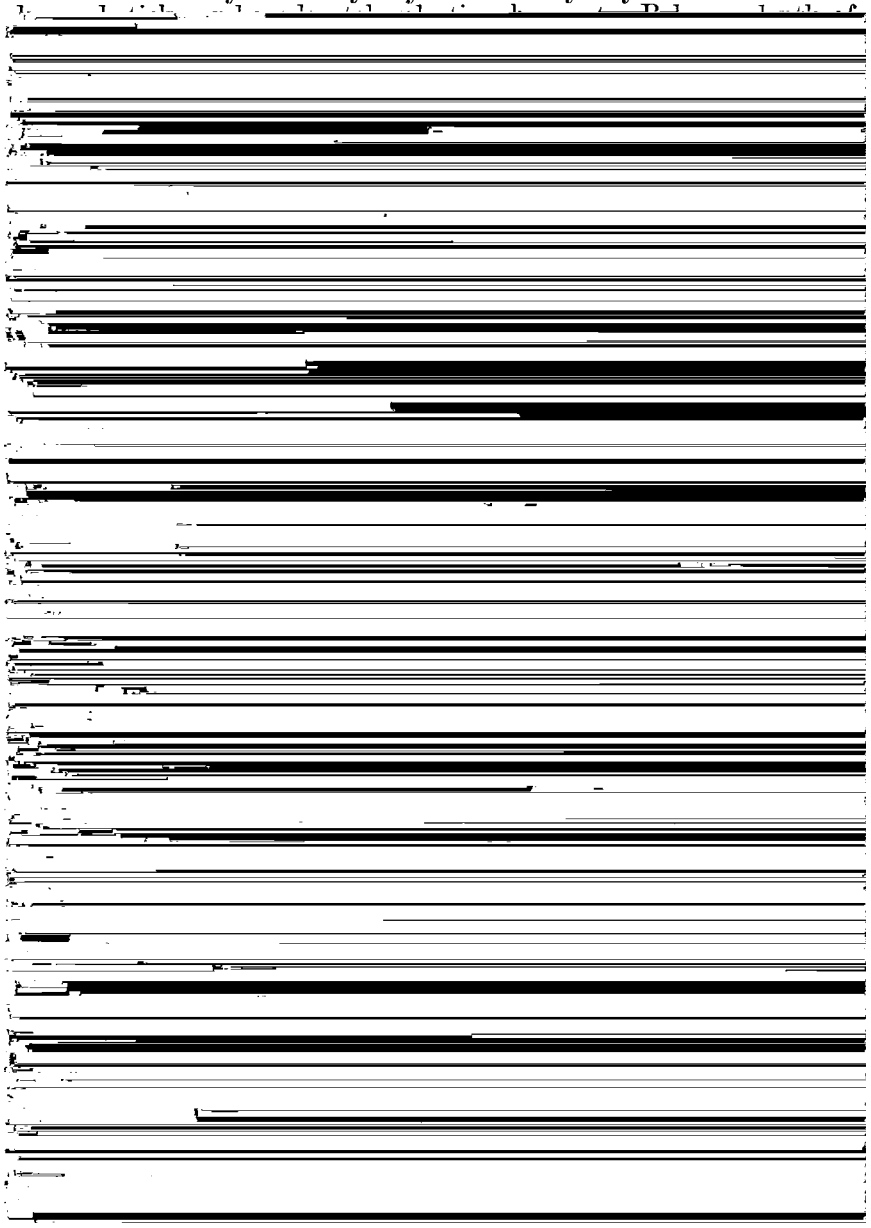
Profile description:

0 to 5 inches, yellowish-brown to grayish-brown moderately friable silty clay loam; somewhat sticky and plastic when wet.
5 to 9 inches, yellowish-brown to reddish-yellow firm silty clay loam with a fine nut structure; relatively hard when dry, sticky and plastic when wet.
9 to 24 inches, yellowish-brown or light reddish-brown silty clay with a medium nut structure; sticky and plastic when wet.
24 to 40 inches, mottled yellow, gray, and brown stiff plastic silty clay.

This medium acid soil has a moderate quantity of organic matter in the surface layer. In some places, especially in the northern part of the Paint Rock River valley, chert is common throughout the soil mass. The soil material in some places, chiefly in the vicinity west of Fabius,

nessee River valley, and those to the east of the river in the northeastern part of the county. This phase has a finer textured less friable surface layer than the rolling phase and represents areas of the rolling phase that have lost approximately 50 to 75 percent of their original surface soil through erosion.

The plow layer, or surface 6 inches, is a mixture of the original surface soil and subsoil materials and in general is dark yellowish-brown or reddish-yellow silty clay loam or silty clay that is hard when



of chert throughout, and a few have a notable admixture of sandy material.

Use and management.—All of Swaim silty clay loam, severely eroded rolling phase, has been cleared and cultivated. The soil is now used chiefly for pasture, but a small part is under a reestablished forest cover in which pine predominates. Because of its low fertility, unfavorable moisture relations, and poor tilth, this land is only fair for crops.

Long rotations consisting chiefly of adequately limed and fertilized close-growing pasture, hay, and fall-sown small grains can be used to advantage in stabilizing the soil and increasing its productivity. Tillage on the contour and perhaps strip cropping are helpful in keeping runoff at a minimum. Many areas are best used for permanent pasture, but those most difficult to stabilize and maintain productive should be reforested.

Swaim silty clay loam, undulating phase (2–5% slopes) (Scu).—Much of this soil lies on gentle valley slopes adjacent to the rough mountain slopes from which a great part of the soil material has been removed. The phase is associated with other Swaim soils and those of the Colbert and Talbott series. It is widely distributed throughout the Paint Rock River valley, the tributary valleys along the western side of the Tennessee River valley, and east of the Tennessee River in the northeastern part of the county. These colluvial areas consist of recently deposited clayey material derived chiefly from limestone. Internal drainage is slow, but runoff is less rapid than on the rolling phase.

Profile description:

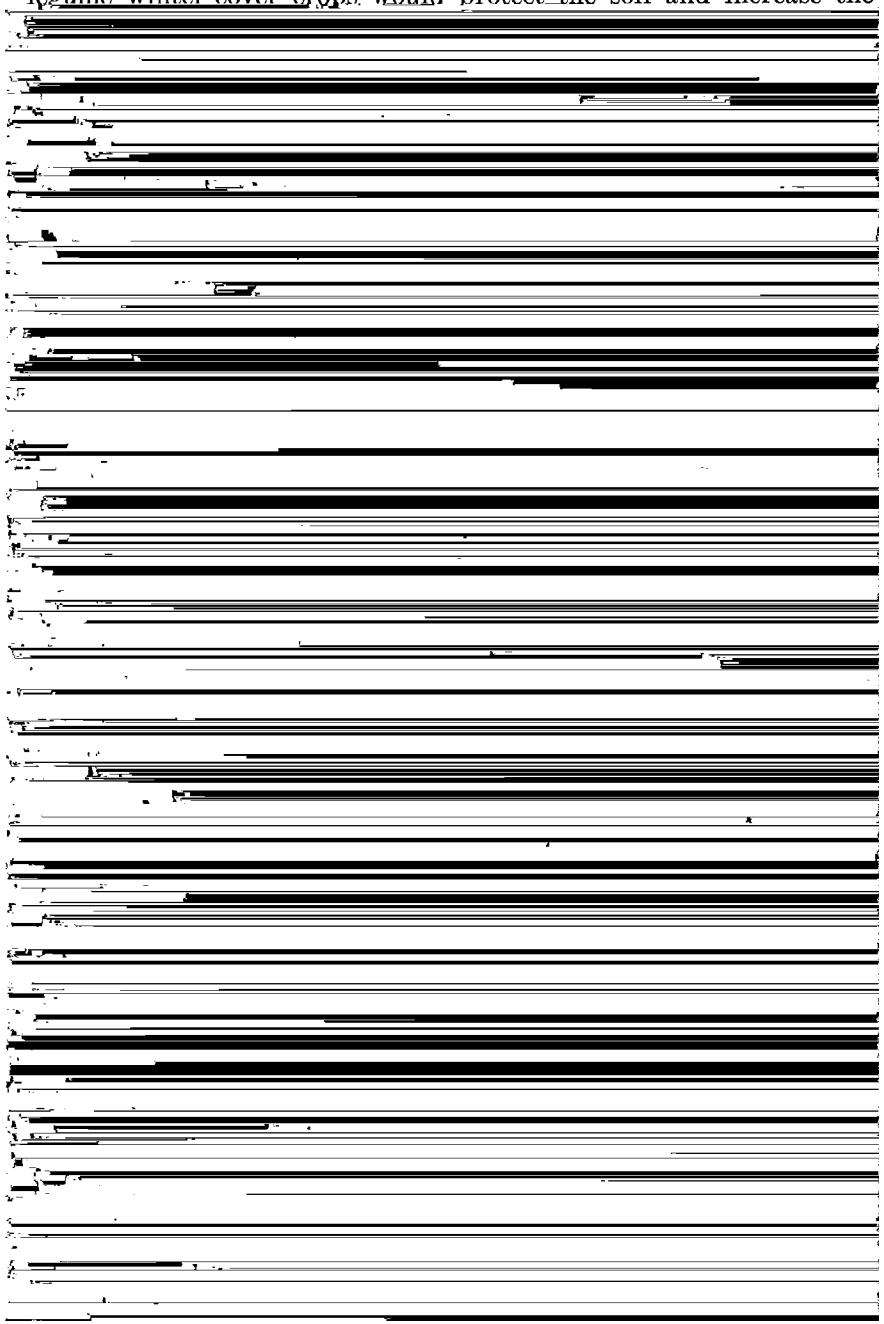
0 to 5 inches, grayish-brown to reddish-brown moderately friable silty clay loam, somewhat sticky and plastic when wet; weakly acid.
5 to 10 inches, yellowish-brown to light reddish-yellow heavy silty clay loam; moderately friable under optimum to moderately dry moisture conditions; sticky and plastic when wet.
10 to 26 inches, yellowish-brown silty clay mottled with yellow, brown, gray, and red in the lower part; has a medium nut structure; sticky and plastic when wet; strongly to medium acid.
26 to 40 inches, mottled yellow, gray, and brown stiff plastic silty clay; strongly acid.

The surface soil has a moderately high content of organic matter. A few areas have a moderate quantity of chert throughout the soil mass, and in places some sandstone fragments and noticeable quantities of sand are intermixed with the soil. Stoniness, however, is not common.

Use and management.—The native vegetation of Swaim silty clay loam, undulating phase, was predominantly deciduous hardwood. Practically all the acreage has been cleared, and much is used now for crops. Corn is the dominant crop, and cotton, soybeans, and lespedeza are common. Cotton is treated with a moderate quantity of mixed complete fertilizer, but other crops generally are not fertilized. Where crops follow cotton, however, they probably benefit to some extent from the treatments for the cotton. Under average management, cotton yields about 280 pounds of lint an acre; corn, about 30 bushels; and soybeans, about 1½ tons of hay. Johnson grass is a common hay crop in places, but many farmers consider it too much like a weed and do not encourage its growth.

The phase is fairly productive and has good workability. It is not difficult to conserve, although runoff is active on the more sloping

parts. It must have some fertilizer, lime, and organic matter if it is to be improved and maintained in a high state of productivity. Rotations of moderate length consisting of row crops alternated with close-growing hay and fall-sown small grains are feasible. The use of legume winter-cover crops would protect the soil and increase the



material is derived largely from limestone and is similar to that of Robertsville, Capshaw, and Etowah soils. External drainage is slow, but its movement is increased somewhat by shallow swales that penetrate into or extend across the soil areas. Internal drainage is fairly slow and becomes slower in the lower subsoil. The water table is near the surface most of the time in winter and in wet periods. Internal drainage can be easily improved with ditches or tile because the subsoil is friable and loose.

The natural vegetation consists mainly of deciduous hardwoods common to soils of similar drainage in the limestone valleys. It includes some water-tolerant trees. Scattered pines grow in places on well-drained hummocks, and cedars grow along shallow swales, especially along those that carry lime-bearing waters from limestone slopes in the uplands.

Profile description:

0 to 5 inches, pale-gray to yellowish-gray loose floury silt loam; organic matter gives upper part of layer a fairly dark color, especially under moist conditions; strongly acid.

5 to 14 inches, pale grayish-yellow friable heavy silt loam grading to silty clay loam; uniform in color when moist; when dry, faintly variegated with gray, yellow, and light brown; strongly acid.

14 to 28 inches, faintly mottled pale grayish-yellow, yellowish-brown, and light reddish-brown friable silty clay loam to silty clay; somewhat plastic in lower part of layer; very strongly acid.

28 to 42 inches, pale-gray silty clay mottled with yellowish brown and reddish brown; friable when moderately dry but sticky and plastic when wet; very strongly acid.

Variations in the color of the profile are common; the color varies from gray to yellow or brownish yellow, especially in the subsoil, but is commonly pale. Slight variations in drainage are strongly reflected in the color of the soil. The better drained areas are more yellow and less gray and have fewer splotches or mottlings. The splotches and mottlings are gray, yellow, brown, and in places red and reddish brown.

Use and management.—Probably 70 percent of Taft silt loam has been cleared for cropland and permanent pasture. Some of the uncleared land is in woodland pasture. Corn, soybeans, lespedeza, and cowpeas are the dominant crops. The soil is fairly responsive to management and gives fair to good crop yields. Some artificial draining is ordinarily necessary for good crop production. Cotton is planted on a few selected better drained areas. The soil is not well suited to winter legumes, because it has a high water table. Winter oats and other small grains are seldom grown except where the soil is artificially drained to prevent water from standing on the surface and to provide outlets for internal drainage. This soil is well suited to pasture grasses.

Talbott silt loam, undulating phase (2–5% slopes) (TBU).—Most of this phase occupies gentle upland slopes in the limestone valleys directly below and adjacent to the rough mountainous slopes. Some areas, however, are in the central part of the Tennessee River valley and disassociated from the rough mountainous slopes. Argillaceous limestone bedrock occurs at a depth of 24 to 90 inches and in places at more than 120 inches. Although the Talbott soils generally consist of clayey residuum formed in place, much of the material has

been water-shifted from adjacent areas of Colbert and Talbott soils, rolling stony land types, and limestone rockland types. Talbott soils resemble the Dewey, differing essentially in having a more plastic clayey subsoil and a shallower depth to bedrock. Internal drainage is slow.

Profile description:

0 to 9 inches, brown granular silt loam grading with depth to more compact

The surface soil is thinner and has more nearly a silty clay loam texture than Talbott silt loam, undulating phase. It represents areas of the silt loam that have lost 50 to 75 percent of the original surface soil through erosion. The 4- to 6-inch plow layer consists of mixed original surface soil and subsoil materials. The average relief is a little more rolling than that of the silt loam, and internal drainage is slower.

Use and management.—All of Talbott silty clay loam, eroded undulating phase, has been cleared, and most of it is now used for general farming. Cotton predominates, but winter oats are common, and soybeans and lespedeza are the most important hay crops. Yields are more variable than on the less eroded silt loam phase.

Although productive, this phase has a higher clay content and shallower depth to plastic clay subsoil than the less eroded silt loam phase

to good management, and yields of 30 bushels of oats or about 1 ton of lespedeza an acre can be expected under such treatment.

Talbott silty clay loam, severely eroded rolling phase (5–12% slopes) (Tcd).—This phase is distinguished from the undulating phase of Talbott silt loam by its reddish stiff silty clay plow layer and its rolling surface. It represents rolling or sloping parts of Talbott soils that have lost practically all of their original surface soil and in places part of the subsoil as a result of erosion. Most of the areas are small, and a great many are composed of single slopes in more extensive areas of less eroded Talbott soils. Internal drainage is slow, and

6 to 10 inches, reddish-brown friable but firm clay loam or silty clay; very sticky when wet, waxlike when moderately dry.
10 to 24 inches, very friable brownish-red silty clay; breaks to soft crumbs but is sticky when wet; numerous small dark concretions.
24 to 48 inches, variegated or mottled dark reddish-brown and yellow massive silty clay; crumbles easily but sticky when wet; grades to unweathered shale with depth.

The surface layer varies in texture from loam to clay loam, depending chiefly on the degree of erosion. In places the surface 6 or 8 inches may consist of the original loam surface soil, but there are localities where the soil consists entirely of silty clay subsoil material. Unweathered shale is at a depth of about 3 to 6 feet on the slopes, but at greater depth on the more gently sloping benches and slope bases, especially in those parts where there are accumulations of colluvial material. Most areas are practically chert free, but chert fragments throughout the entire soil mass are common to some areas. The fragments, however, are seldom sufficiently abundant to interfere materially with tillage.

Use and management.—Although Tellico clay loam, eroded rolling phase, is moderately fertile, it is strongly acid throughout its entire depth and therefore requires lime for many crops. It is easily worked and responds well to good management but is notably subject to erosion. Under good management it is suited to most crops commonly

used as unimproved pasture. Chiefly because of its low productivity and the difficulty of conserving it when cropped, it is best suited to either permanent pasture or forest. Annual lespedeza, hop clover, Dallis grass, and certain other common grasses are well suited. In order to establish a good vegetative cover, heavy fertilization and liming will be required. Kudzu and sericea lespedeza are suited and with proper fertilization will establish a good cover within a short time.

Tupelo silt loam, level phase (0–2% slopes) (Tuv).—Like other Tupelo soils, this phase occupies moderately low stream terraces consisting of alluvium, chiefly of limestone origin, with which some material from sandstone and shale is intermixed. Relatively large areas are widely distributed throughout the broader tributary valleys of the limestone valleys. Internal drainage is slow to very slow, chiefly because of the compact tight subsoil.

Profile description:

0 to 6 inches, yellowish-gray friable silt loam.
6 to 10 inches, faintly mottled grayish-yellow and light yellowish-brown moderately friable silty clay; plastic when wet.
10 to 30 inches, mottled yellowish-brown and gray tight clay; sticky and plastic when wet; easily broken or cracked into hard irregular fragments when dry.
30 to 48 inches, pale-gray to bluish-gray heavy sticky clay somewhat mottled with brownish yellow and very dark brown.

The surface layer in general is medium acid, and the sublayers very strongly acid. The depth to bedrock limestone ranges from 2 or 3 feet in some places to more than 8 feet in others. Iron concretions are sufficiently abundant in places to form a fairly solid hardpan at a depth of 12 to 30 inches. These small hardpan areas generally occur as strips 5 to 10 feet wide and 50 to 100 feet or more long. They are generally in shallow draws, swales, or small depressions too small to be shown separately on the soil map.

Use and management.—About 50 percent of Tupelo silt loam, level phase, is in native forest consisting chiefly of deciduous hardwoods—water, post, and white oaks, and shell or scaly-bark and black hickories. Willows, maples, elms, ironwood, beech, yellow-poplar, red or sweetgum, blackgum, dogwood, and cedar are among the less common trees. Much of the acreage not forested is used for crops, chiefly corn and hay and pasture crops.

The soil is not difficult to work, although tillage operations are retarded by slow internal drainage. Chiefly because of its low fertility, compact subsoil, and poor internal drainage, the soil is not well suited to such tilled crops as cotton and alfalfa. It is a cold soil, and the planting of many crops has to be delayed in spring. Under natural drainage conditions it is relatively well suited to pasture grasses and some clovers, but productive pasture also requires adequate fertilization and liming and proper seeding.

Erosion is not a hazard, and under proper management, including adequate fertilization, liming, and surface drainage, the soil responds fairly well. Artificial drainage by open ditches greatly improves this soil for crops and makes it productive of cotton in some areas. Winter oats and cover crops do fairly well on the drained areas, although even these areas become wet in some seasons and crops are damaged. Summer legumes and lime are useful in increasing productivity.

Tupelo silt loam, undulating phase (2–5% slopes) (Tuu).—This soil occurs in association with the level phase and with soils of the Capshaw, Monongahela, and Colbert series. It is very gently rolling or undulating, except along the sharp breaks of the stream terraces adjacent to the bottom lands, where the gradient may be 7 percent. Few of the terraces, however, rise more than 4 feet above the adjacent bottom lands. Drainage is somewhat better than for the level phase, but the characteristics of the two soils are otherwise similar. The subsoil of the undulating phase, however, is more consistently yellow.

The entire profile is medium to very strongly acid and very low in organic matter. The texture of the surface soil is coarser in many of the areas at the upper ends of the valleys, these areas being closer to the soils of the sandy plateaus and mountain slopes. The depth of the surface layer ranges from 7 to about 12 inches, and the color of the subsoil from gray to mottled grayish yellow, brown, and gray.

Use and management.—Tyler very fine sandy loam is largely in forest, and the chief use for the cleared land is pasture. The native vegetation is chiefly deciduous hardwoods, with water and post oaks, ash, elm, yellow-poplar, and beech predominating. The limited part cropped is used for soybeans, sorghum, lespedeza, and corn. Under average management, which includes limited fertilization but no cover crops or artificial drainage, yields are usually low. Corn yields about 8 bushels, and lespedeza, about ⅗ ton an acre.

Chiefly because of its very slow drainage and low fertility, this soil is poorly suited to crops. Much of it, however, will afford good pasture if adequate lime and fertilizer are applied, proper seeding is carried out, and good surface drainage is established. Surface drainage by means of ditches improves suitability for both crops and pasture. Tile drainage is less feasible in most places because of the tight or very slowly pervious clay subsoil. Drained areas are used for corn, lespedeza, grain sorghum, and soybeans. Selected better drained areas are planted to cotton, and yields are satisfactory.

Waynesboro fine sandy loam, undulating phase (2–5% slopes) (WNU).—This phase is associated with other members of the Waynesboro series and with Holston and Sequatchie soils. It occurs as small irregular well-drained areas on relatively high stream terraces. Like the other Waynesboro soils, the parent material is a mixture derived from sandstone, shale, and limestone. The native vegetation was predominantly deciduous hardwoods, chiefly oak and hickory.

Profile description:

0 to 7 inches, grayish-brown very friable fine sandy loam or loam.
7 to 12 inches, yellowish-brown friable fine sandy loam or loam grading with depth to sandy clay loam.
12 to 28 inches, yellowish-red friable clay loam that becomes deeper red with depth; nutlike structure; firm but moderately permeable to both roots and moisture.
28 to 66 inches, brownish-red or deep red friable clay loam; breaks easily into nutlike fragments; moderately sticky and plastic when wet; generally finer textured in the lower part.

The entire soil mass is medium to very strongly acid, the lower part being more acid than the surface layer. The content of organic matter is greater than that of the Holston soils but is not so great as that of the Cumberland. The texture of the sublayers varies. In many places the soil is relatively free of sand and is made up of silty clay loam or silty clay. In other places there are streaks or thin layers of coarse gravel, pebbles, or chert in the deep subsoil. In some areas gravel, stones, pebbles, and cobbles occur throughout the soil mass, and in a few places these are sufficiently abundant to interfere somewhat with tillage. Some of the more gravelly areas, which are northeast and east of Stevenson, have a grayer surface soil and more friable subsoil than is typical. The thickness of alluvium over bedrock or cherty residuum varies greatly, the depth in some places being more than 15 feet, and in a few others, not more than 3 or 4 feet.

Use and management.—Waynesboro fine sandy loam, undulating phase, is moderately fertile, relatively high in moisture-holding capacity, and favorable in tilth. Practically all of it has been cleared and is being cropped, chiefly to cotton, corn, and hay, mostly lespedeza. Some fertilization is practiced, and a few legume cover crops are grown. This phase, however, is planted in row crops most of the time. Under average conditions cotton yields about 360 pounds of lint an acre, and corn about 35 bushels an acre.

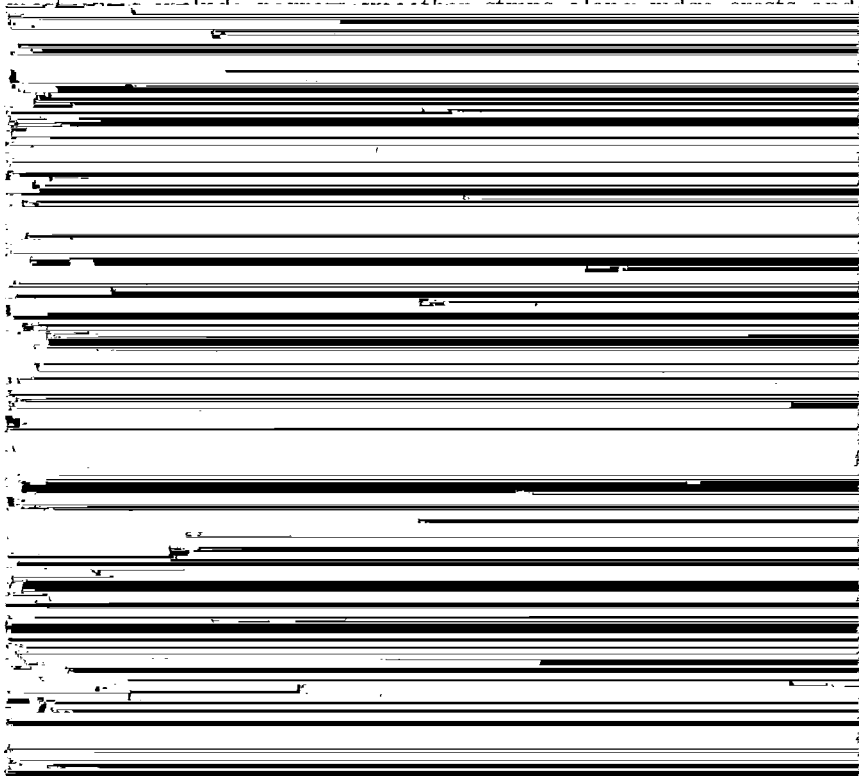
This soil is relatively well suited to moderately intensive use where it is adequately fertilized, its organic matter is maintained at a high level, and runoff is controlled. It is easily worked and not difficult

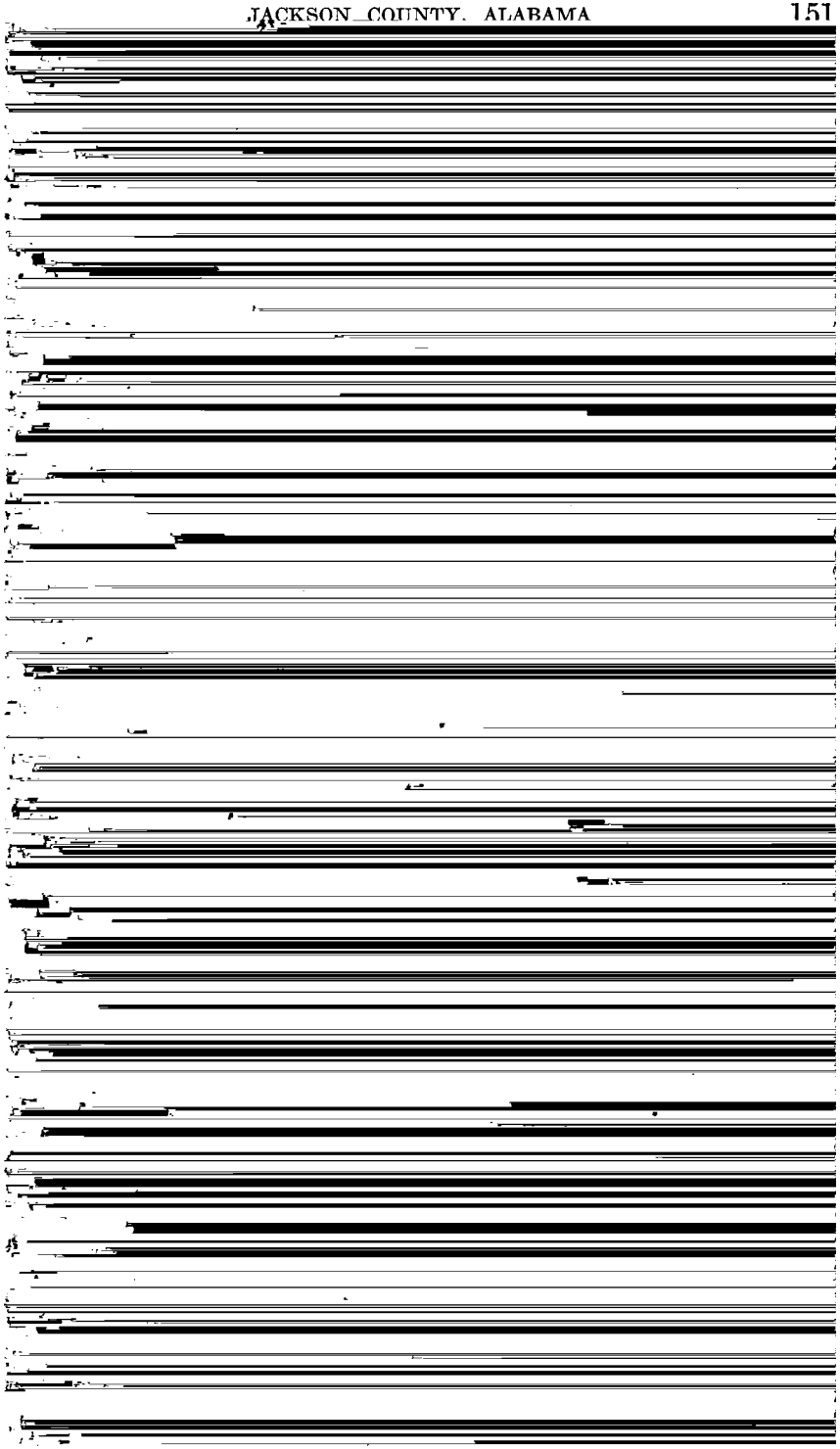
guished from the undulating phase by its stronger slope and greater variability in the thickness of the surface layer. On the more sloping parts the surface layer may be less than 4 inches deep, whereas on the lower slopes or basin parts it may exceed 10 inches. Surface drainage is rapid, and internal drainage moderate.

Use and management.—Most of Waynesboro fine sandy loam, rolling phase, is cleared and used for general farm crops, chiefly cotton, corn, and hay. Some sericea lespedeza and legume cover crops are grown. Row crops occupy this soil much of the time, and most crops, especially cotton, receive moderate applications of fertilizer.

This is a moderately productive soil, but because of its rolling surface its workability is not so good as that of the undulating phase. More exacting water-control measures must be used to protect it from erosion. The best management practices include moderately long rotations and consistent use of winter cover crops. Where at all feasible, tillage should be on the contour, and terraces should be used in places. Under a high level of management, cotton yields 400 pounds of lint to the acre; corn, 38 bushels; and alfalfa, 3 to 3½ tons. Like other Waynesboro soils, this phase is productive of pasture where fertility is brought to a high level, adequate lime is applied, and the land is properly seeded.

Waynesboro fine sandy loam, eroded rolling phase (5–12% slopes) (WNN).—Practically all of this phase occurs in the main parts of the limestone valleys. Although the relief is in general rolling,





areas that include smoother narrow ridge tops. It differs from Waynesboro fine sandy loam, undulating phase, chiefly in having a reddish clay loam plow layer and a rolling rather than undulating surface. Surface drainage is rapid; internal drainage, moderate to slow.

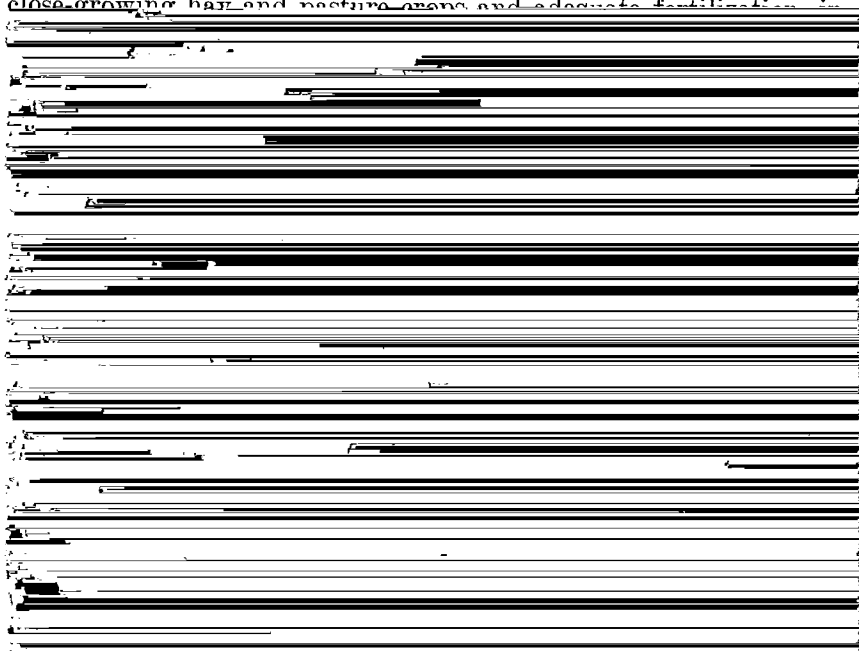
Profile description:

0 to 16 inches, yellowish-red friable clay loam; deeper red with depth; permeable but firm; much slower water absorption than the fine sandy loam surface layer of uneroded Waynesboro soils.
16 to 45 inches, brownish-red or deep red friable clay loam that forms nutlike fragments when broken.

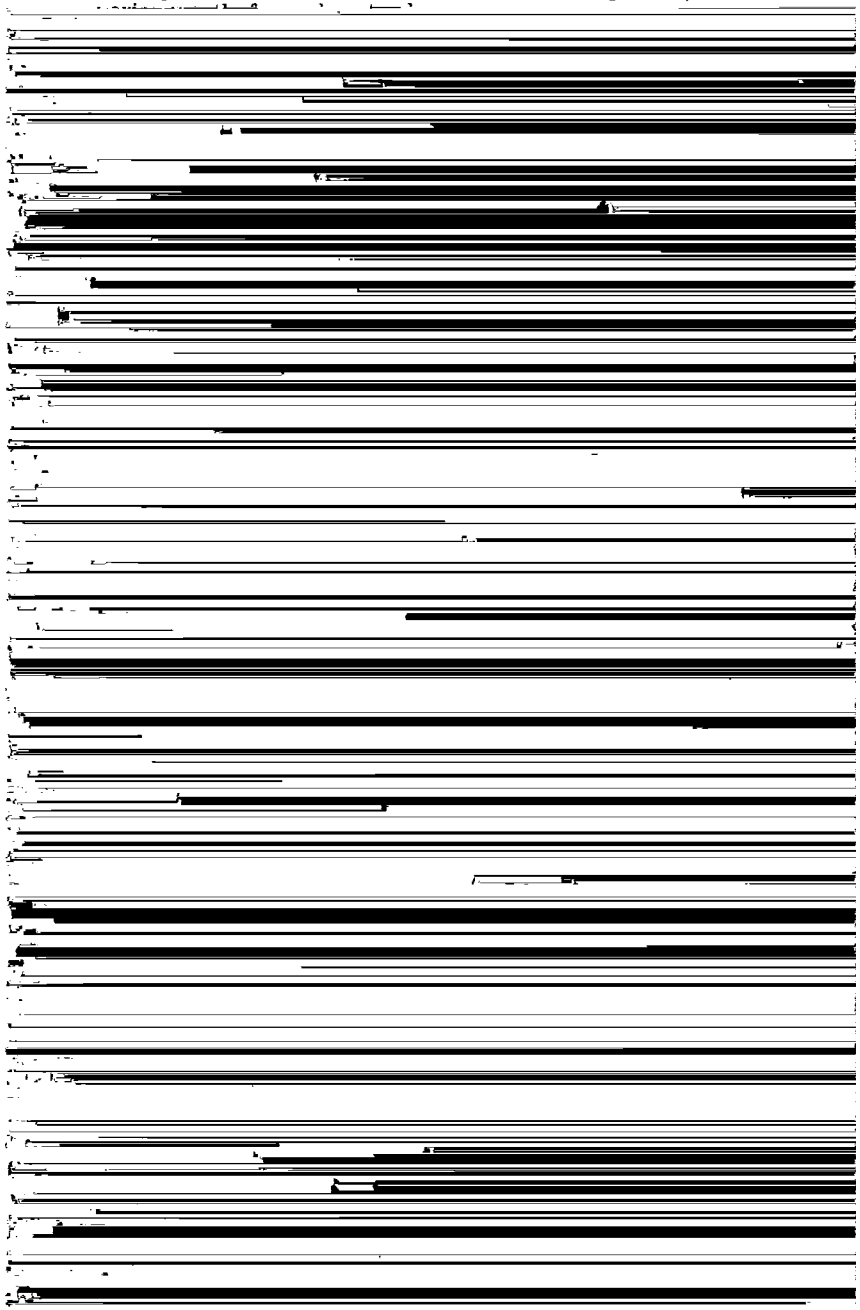
The entire soil is medium to strongly acid and is low in fertility and organic matter. Gravel, cobbles, pebbles, and chert fragments occur throughout the soil mass in a few places.

Use and management.—All of Waynesboro loam, severely eroded rolling phase, has been cleared and cropped, but much of it is now idle or is being used for permanent pasture. Some areas have grown up in a volunteer stand of pine, and a very small part has been reforested by planting. Cotton and hay, chiefly lespedeza, are the principal crops. Cotton predominates, but yields are low. The pasture vegetation is common lespedeza, Dallis grass, hop clover, and native grasses. Very little pasture has been improved by seeding or fertilization.

Chiefly because of its low fertility and the difficulty of controlling runoff water, this soil is not well suited to intensive use. It is difficult to work, and exacting practices are required to control runoff. Under proper management, however, it responds well and is capable of producing fairly good pasture, hay crops, and some few row crops. Proper management requires especially long rotations consisting of close-growing hay and pasture crops and adequate fertilization in



18 to 30 inches, somewhat more friable yellowish-brown silty clay mottled with yellow and gray; mottling increases with depth.
30 to 42 inches, mottled yellowish-brown and yellowish-gray silty clay containing gritty material, mainly fine chert fragments; chert content



responsive to good management. Under average conditions it is suited to rotations of moderate length if it is adequately limed and fertilized. Legume cover crops will improve fertility and tilth and protect the soil from erosion.

USE AND MANAGEMENT OF IMPORTANT SOIL GROUPS

Each soil of Jackson County has characteristics that distinguish it from the others. Many of the soils, however, require approximately the same management and may be grouped together for purposes of

for the Ooltewah and Lindside soils is sufficiently retarded to cause the subsoil to have excess moisture below a depth of 15 to 20 inches for part of the growing season.

This group of soils is very productive. Much of the acreage not protected from floods has its fertility constantly replenished by fresh sediment deposited by floodwaters. Most of the soils can be easily

TABLE 7.—*Fertility, workability, and conservability of soils of Jackson County, Ala., in management group 1*

Soil	Fertility	Workability	Conservability
Abernathy silt loam:			
Level phase	Very high	Very good	Excellent.
Undulating phase	do	do	Very good.
Egam silt loam	High	do	Do.
Egam silty clay loam	do	do	Do.
Huntington silt loam	Very high	do	Excellent.
Lindside silt loam	do	Good	Do.
Lindside silty clay	do	Fair	Very good.
Lindside silty clay loam	do	Good	Do.
Ooltewah silt loam	do	do	Do.

GROUP 2

The imperfectly and well drained sandy medium to slightly acid soils of the first bottoms in the limestone valleys form group 2. These soils consist predominantly of fine sandy loams. Bruno loamy fine sand, however, has a coarser texture and consequently looser consistence. The soils are characterized by a nearly level or very gently undulating surface and are subject to overflow. Compared with the

as alfalfa and sweetclover, may be expected to do well on the Abernathy and Bruno soils, but bluegrass, Bermuda grass, and common white clover are not so productive. These soils therefore may be utilized better for rotations consisting largely of row crops.

The fertility, workability, and conservability of the soils in management group 2 are given in table 8.

TABLE 8.—*Fertility, workability, and conservability of soils in*

TABLE 9.—*Fertility, workability, and conservability of soils in Jackson County, Ala., in management group 3*

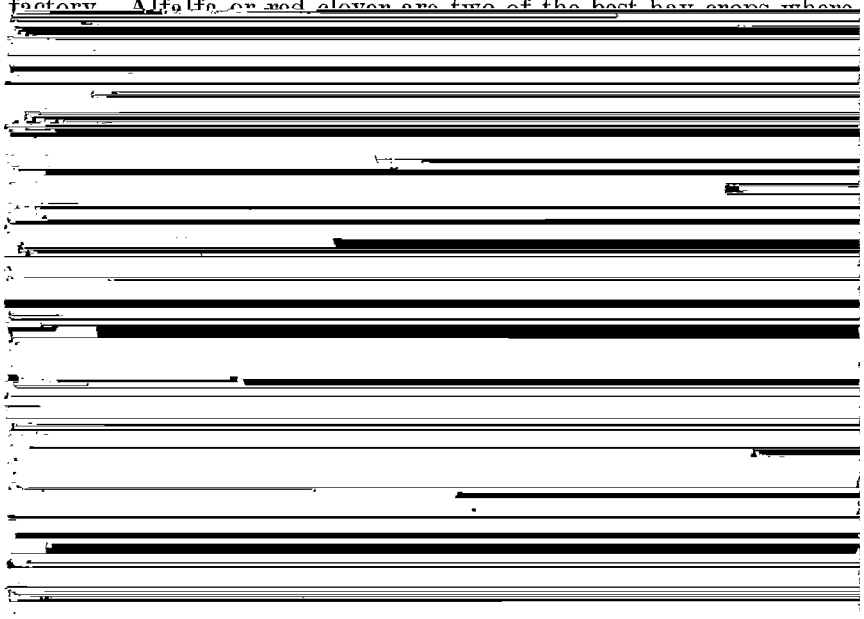
Soil	Fertility	Workability	Conservability
Barbourville-Cotaco fine sandy loams	Medium	Very good	Very good.
Pope fine sandy loam	do	do	Do.

GROUP 4

Group 4 consists of red fine-textured permeable level to undulating soils of the limestone valleys. These soils have friable surface layers, predominantly of silt loam, and contain a moderate quantity of organic matter. Their subsoils are firm silty clay loam to silty clay but are permeable to both roots and moisture. Bedrock is deep.

In general, the soils are fertile, have relatively favorable moisture relations, and are capable of retaining a relatively large supply of available plant nutrients. They are good to excellent for the production of crops and pasture. Their productivity is high, and workability is very good. They are easily protected against losses either of soil material or of plant nutrients, although the more sloping parts are somewhat subject to erosion. They are well suited to practically all crops common to the area and on the whole are probably among the most suitable soils for cotton.

Although the soils of this group are not so well suited to intensive use as are those of groups 1 and 2, they are suited to moderately short rotations. A rotation of cotton or corn followed by small grains seeded to legume hay that will remain 1 or more years is very satisfactory. Alfalfa or red clover are two of the best hay crops where



lent of 1 ton of ground limestone, 300 pounds of 20-percent phosphate fertilizer, and 25 pounds of potash an acre for red clover and the equivalent of 2 tons of ground limestone, 500 pounds of 20-percent phosphate fertilizer, and 20 to 50 pounds of potash an acre for alfalfa. The quantity of each element should vary with the past management or with the fertility level at the time of application. Where barnyard manure is available in sufficient quantity, potash applications may be less justified. Observations of experiments indicate that light applications of borax are needed to correct boron deficiencies for alfalfa. Most vegetable crops require heavy applications of phosphorus, potash, and nitrogen.

The soils of this group can be tilled through a relatively wide range of moisture conditions, but not when they are wet. Where short rotations are used, tillage should be on the contour, especially on the more sloping parts, and terracing may be justifiable on the more sloping parts where row crops are grown at frequent intervals. Terraces are not required where the soil is kept under a luxuriant close-growing vegetative cover much of the time.

With adequate liming, applications of phosphorus, and proper seeding, high-quality pasture can be obtained. Some nitrogen and potash, however, may be needed to establish a good stand. Dallis grass, annual lespedeza, white clover, bluegrass, orchard grass, and Bermuda grass are well suited and produce abundantly where these soils are in a high state of fertility. To insure the best pasture, weeds should be kept clipped and extremes of too heavy growth and excessive grazing should be avoided.

The fertility, workability, and conservability of the soils in management group 4 are given in table 10.

TABLE 10.—*Fertility, workability, and conservability of soils in Jackson County, Ala., in management group 4*

Soil	Fertility	Workability	Conservability
Cumberland loam, undulating phase	High	Very good	Very good.
Cumberland silt loam, undulating phase.	do	do	Do.
Cumberland silty clay loam, eroded undulating phase.	do	do	Good.
Dewey cherty silt loam, eroded undulating phase.	do	Good	Very good.
Dewey silt loam, undulating phase	do	Very good	Do.
Dewey silty clay loam, eroded undulating phase.	do	do	Good.
Etowah loam:			
Level phase	do	do	Excellent.
Undulating phase	do	do	Very good.
Etowah silt loam:			
Level phase	do	do	Excellent.
Undulating phase	do	do	Very good.
Etowah silty clay loam, eroded undulating phase.	do	do	Do.
Hermitage silty clay loam, eroded undulating phase.	do	do	Good.

GROUP 5

Group 5 consists of red fine-textured permeable rolling soils of the limestone valleys. These soils differ from those of group 4 chiefly in their greater slope, the gradient of most of the areas ranging from 5 to 12 percent. Because erosion has been more active, the friable silt loam surface layer is thin. The severely eroded rolling phases have lost the friable silt loam surface layer, and their plow layer consists of firm silty clay of less favorable tilth and moisture-absorbing quality than that for other soils of the group. Large quantities of chert are scattered throughout the entire depth of the cherty Dewey types, interfering with tillage and lowering the general level of fertility. With the exception of the severely eroded rolling phases, however, these soils make good cropland and good to very good pasture land. They are suited to practically all crops commonly grown, although they are less well suited to frequent row cropping than the soils of the first four groups. Close-growing crops as hay, pasture, and small grains are particularly well suited.

Chiefly because of their stronger slope and consequently greater susceptibility to erosion, the soils cannot be planted to row crops so frequently as those of group 4 if they are to be maintained at a high level of productivity. Where properly fertilized, soils of group 5 may be planted to 4- or 5-year rotations consisting of 1 year of row crops and 3 or 4 years of close-growing crops. A 4- or 5-year rotation of cotton or corn, small grains, clover and grass, and grass and clover for hay or rotated pasture is suitable. A longer rotation of cotton or corn for 1 year, small grains for 1 year, and alfalfa for 3 to 4 years is also satisfactory. Other intertilled crops may be used in place of corn.

Like the soils of group 4, the soils of group 5 require systematic fertilization if their productivity is to be maintained at a high level. Legume cover crops used as green manure contribute much in maintaining the organic and nitrogen supply, but applications of phosphate fertilizer and potash, either in the form of commercial fertilizer or barnyard manure, are required. Moderate applications of lime at regular intervals are needed, especially for alfalfa, red clover, and like legume crops.

Where these soils are maintained at a high level of fertility and properly seeded, they support good pasture of excellent carrying capacity. Phosphorus and lime are probably the chief fertilizer elements necessary. Bluegrass, annual lespedeza, white clover, and Bermuda grass are well suited pasture plants. Regular clipping of weeds and other undesirable growth is generally required in maintaining high-quality pasture. Grazing off surplus vegetation is as important as avoiding overgrazing.

The fertility, workability, and conservability of soils in management group 5 are given in table 11.

TABLE 11.—*Fertility, workability, and conservability of soils in Jackson County, Ala., in management group 5*

Soil	Fertility	Workability	Conservability
Cumberland silt loam, rolling phase	High	Good	Good.
Cumberland silty clay loam:			
Eroded rolling phase	do	do	Do.
Severely eroded rolling phase	Medium	Poor	Fair.
Dewey cherty silt loam, eroded rolling phase.	High	Fair	Good.
Dewey cherty silty clay loam, severely eroded rolling phase.	Low	Poor	Fair.
Dewey silt loam, rolling phase	High	Good	Good.
Dewey silty clay loam:			
Eroded rolling phase	do	do	Fair.
Severely eroded rolling phase	Medium	Poor	Do.

these crops are not regularly used, manure and nitrogen-bearing fertilizers will be required. Legume crops in general respond well to lime and phosphorus; alfalfa and red clover usually require applications of these materials.

The Hartsells soils of this group are especially well suited to cotton

GROUP 7

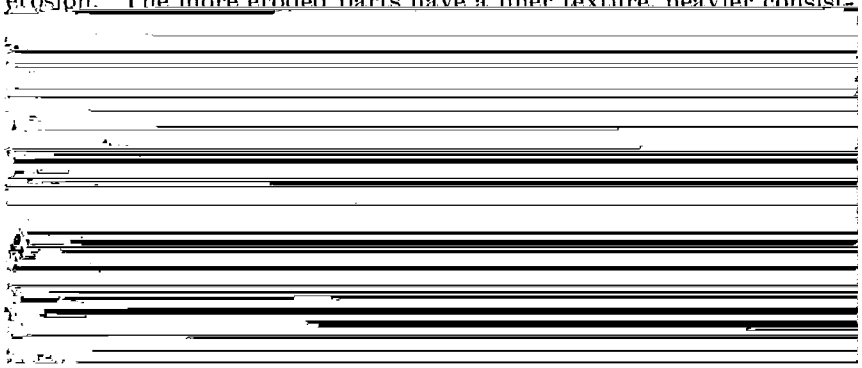
TABLE 13.—*Fertility, workability, and conservability of soils of Jackson County, Ala., in management group 7*

Soil	Fertility	Workability	Conservability
Allen fine sandy loam:			
Eroded rolling phase	Medium	Good	Good.
Rolling phase	do	do	Do.
Allen loam, severely eroded rolling phase.	Low	Poor	Fair.
Enders silt loam:			
Eroded rolling phase	do	Good	Do.
Rolling phase	do	do	Good.
Hanceville fine sandy loam:			
Eroded rolling phase	Medium	do	Do.
Rolling phase	do	do	Do.
Hartsells fine sandy loam:			
Eroded rolling phase	Low	do	Fair.
Rolling phase	do	do	Do.
Jefferson-Allen loams, eroded rolling phases.	do	do	Do.
Jefferson fine sandy loam:			
Eroded rolling phase	do	do	Do.
Rolling phase	do	do	Good.
Waynesboro fine sandy loam:			
Eroded rolling phase	Medium	do	Do.
Rolling phase	do	do	Do
Waynesboro loam, severely eroded rolling phase.	Low	Poor	Fair.

GROUP 8

Group 8 contains reddish-yellow undulating soils with plastic subsoils. These soils are moderately shallow to bedrock limestone. Their surface or plow layers are heavier in consistence than those of soils in group 4. Their profile is medium to strongly acid. Owing chiefly to their more plastic and clayey texture, moisture relations are less favorable than in soils of group 4.

These soils are moderately productive, especially for selected crops grown under proper management. Their workability is good but it varies according to the quantity of surface soil material lost through erosion. The more eroded parts have a finer texture, heavier consist-



some of the more loamy soils, and root crops cannot be expected to develop well.

The supplies of organic matter, plant nutrients, and lime must be replenished regularly when the soils are cultivated. Organic matter

grown for as many years as a good stand can be maintained. Areas not required for cultivation can be left in permanent pasture, as the soils are well suited to that use. When used as pasture the soils are adequately protected from erosion. Tilled crops should be followed by close-growing fall-sown small grains if possible, and row crops should be followed by a cover crop. Tillage operations should be on the contour, but terracing may not be feasible. Strip cropping, especially on the longer slopes, may be of some practical value. Where severely eroded patches of these soils occur in areas better suited to tillage, it may be best to establish a permanent sod on them.

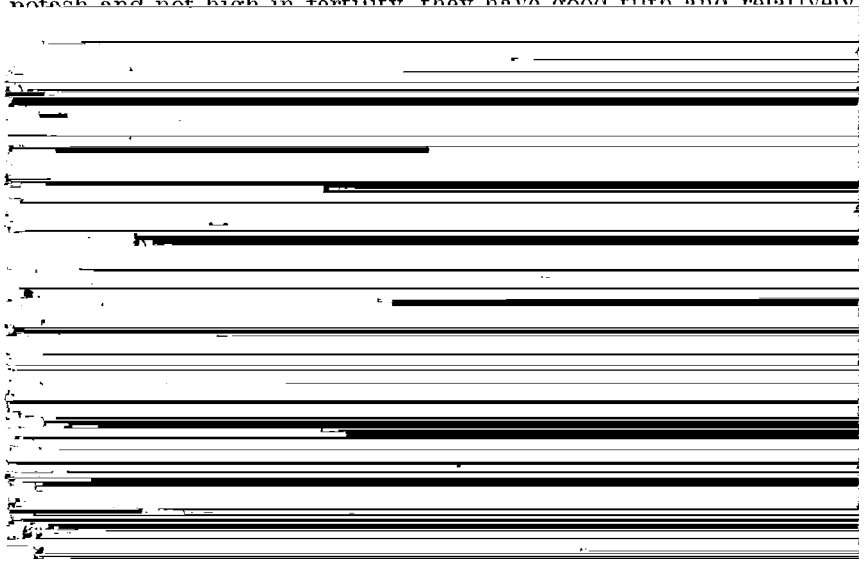
The fertility, workability, and conservability of the soils in management group 9 are given in table 15.

TABLE 15.—*Fertility, workability, and conservability of soils of Jackson County, Ala., in management group 9*

Soil	Fertility	Workability	Conservability
Swaim silty clay loam:			
Eroded rolling phase	Medium	Fair	Fair.
Rolling phase	do	Good	Do.
Severely eroded rolling phase	Low	Poor	Poor.
Talbott silty clay loam:			
Eroded rolling phase	Medium	Fair	Fair.
Severely eroded rolling phase	Low	Poor	Poor.

GROUP 10

Group 10 consists of reddish-yellow and yellow undulating permeable soils from dolomitic limestone material. These soils have great depth to bedrock. Although they are low in lime, phosphate, and potash and not high in fertility, they have good tilth and relatively



well suited to many truck crops because they have fairly good tilth, respond reasonably well to fertilization, and hold an adequate supply of moisture at all times except the driest part of the growing season.

These soils are less well suited to pasture than those of several preceding groups because it is more difficult to maintain a grazing cover of as high productivity and quality. Where adequately fertilized, limed and seeded, however, Dallis grass, annual lespedeza, white clover, and like pasture plants produce well. Clipping is usually necessary to keep down weedy growth.

The fertility, workability, and conservability of the soils in management group 10 are given in table 16.

TABLE 16.—*Fertility, workability, and conservability of soils of Jackson County, Ala., in management group 10*

Soil	Fertility	Workability	Conservability
Clarksville cherty silt loam:			
Eroded undulating phase	Low	Fair	Good.

other row crop followed by a fall-sown small grain and 3 or 4 years of hay and pasture.

Relatively heavy and frequent fertilization is required if the soils are to be maintained at a moderately high level of productivity when used for a crop rotation. Organic matter must be added in the form of green-manure or barnyard manure, and moderate quantities of lime, phosphate, and potash must be applied. Two tons of calcium car-

GROUP 12

Imperfectly drained undulating and nearly level soils on stream terraces make up group 12. These soils have silt loam surface layers, level to undulating surfaces, and slow to moderate internal drainage. They consist of mixed alluvium and occupy moderately low stream terraces in the limestone valleys. Some are wet during moister seasons of the year, and a very small area is subject to occasional flooding.

In general the soils have low to moderate fertility, good to very good workability, and very good conservability. The Monongahela

TABLE 18.—*Fertility, workability, and conservability of soils of Jackson County, Ala., in management group 12*

Soil	Fertility	Workability	Conservability
Capshaw silt loam:			
Level phase	High	Very good	Very good.
Undulating phase	do	do	Do.
Monongahela loam:			
Level phase	Low	Good	Good.
Undulating phase	do	do	Do.
Taft silt loam	do	do	Very good.
Tupelo silt loam:			
Level phase	do	do	Do.
Undulating phase	do	do	Good.
Wolftever silt loam:			
Level phase	Medium	do	Very good.
Undulating phase	do	do	Good.

GROUP 13

Group 13 is composed of shallow well-drained permeable undulating and rolling soils. These strongly acid soils are shallow to bedrock sandstone or shale, which occurs at an average depth of 18 to 26 inches. Internal drainage is good. Natural fertility is low. The soils have favorable tilth, but the quantity of moisture available to plants is not generally adequate.

The soils respond well to fertilization. Adequate fertilization with phosphorus, potash, and nitrogen is necessary in obtaining high yields. Organic matter is naturally low and must be replenished at regular intervals in order to maintain high productivity. Moderate applications of lime are required for practically all legumes, especially red clover and alfalfa. Workability is good except for occasional rock outcrops. Conservability is fair to good, depending chiefly on the slope. The ability of these soils to hold plant nutrients is not high, and therefore fertilization should be in smaller quantities but at more frequent intervals than is required for many of the finer textured friable soils.

In general these soils are fair to good for crops and pasture. They are not well suited to intensive use, chiefly because of their generally moderate to strongly sloping surfaces, shallow depth to bedrock, and low fertility. Rotations of at least moderate length should be used, and cover crops should be sown following row crops where the land otherwise would be left fallow. Areas that must be used for row crops such as corn should be seeded to crotalaria, vetch, or some other cover crop at the time the row crop is last cultivated. Sericea lespedeza is a good hay or pasture crop. Redtop, annual lespedeza, and red clover are suitable hay crops, and where the area is not needed for row crops, the soil can be kept in meadow for extended periods.

If cultivated, the more rolling parts should be tilled on the contour. Strip cropping may be justified on the longer slopes. On many farms the soils are best used for permanent pasture, but proper seeding and adequate fertilization are necessary to establish and maintain a good stand of pasture. A mixture of Dallis grass, annual lespedeza, and white clover is well suited.

The fertility, workability, and conservability of the soils in management group 13 are given in table 19.

TABLE 19.—*Fertility, workability, and conservability of the soils of Jackson County, Ala., in management group 13*

Soil	Fertility	Workability	Conservability
Enders silt loam:			
Eroded rolling shallow phase	Low	Good	Poor.
Rolling shallow phase	do	do	Do.
Hartsells fine sandy loam:			
Eroded rolling shallow phase	do	do	Do.
Eroded undulating shallow phase	do	Very good	Good.
Rolling shallow phase	do	Good	Fair.
Undulating shallow phase	do	Very good	Good.

GROUP 14

Red fine-textured permeable hilly soils make up group 14. These soils are deep to bedrock, permeable to both roots and moisture, and relatively fertile. In severely eroded areas the plow layer is compact silty clay with unfavorable tilth. A greater part of the acreage, however, has a friable silt loam or silty clay loam plow layer.

Natural productivity is moderately high. Workability is poor to fair, as the strong slope interferes with field operations. The severely eroded areas are particularly difficult to work because of their strong slopes and the unfavorable tilth of the plow layer. Where a good vegetative cover is maintained, plant nutrients are not difficult to conserve. Under cultivation the soils are seriously damaged by erosion because the rate of runoff is high.

These soils are poor to fair for crops and fair to very good for pasture. They are not well suited to row crops but are well suited to alfalfa and red clover and practically all of the commonly grown pasture plants. Where feasible, they should be kept in permanent meadow and pasture. Where row crops must be grown, at least moderately long rotations should be used. In these rotations cover crops should follow the row crops directly if other fall-sown close-growing crops are not sown. Where row crops are grown once in 4 or 5 years, erosion is a definite hazard.

Although these soils are relatively fertile, they must be regularly fertilized and limed if their fertility is to be maintained at a high level. Lime is required especially for alfalfa and red clover, which give good yields when grown under a high level of management. Areas that are cultivated should be tilled along the contour. Strip cropping may be of value in controlling runoff on the longer slopes. In general the soils are too steep for terracing.

Permanent pasture of Dallis grass, annual lespedeza, and white clover produces well where adequate lime and phosphorus have been

applied. Under these conditions, Kentucky bluegrass, orchard grass, and Bermuda grass, have a high carrying capacity. As on most other soils, weedy vegetation must be clipped in order to keep down undesirable vegetation.

The fertility, workability, and conservability of the soils in management group 14 are given in table 20.

TABLE 20.—*Fertility, workability, and conservability of soils of*

On farms where some of these soils must be used for crops, long to very long rotations are best. In general row crops should not be grown more than once in 6 or 7 years. With such a system, a row crop should be followed directly either by a legume cover crop or by a fall-sown small grain. Where small grains follow row crops, the soils should be seeded to mixed legume and grass for meadow or pasture that will remain 4 or 5 years if feasible. On areas tilled even at infrequent intervals, tillage should be with the contour, and strip cropping may be of value in restraining erosion on the longer slopes. Terracing is not commonly considered a feasible practice on soils having a slope as steep as these.

The fertility, workability, and conservability of the soils in management group 15 are given in table 21.

TABLE 21.—*Fertility, workability, and conservability of soils of Jackson County, Ala., in management group 15*

Soil	Fertility	Workability	Conservability
Armuchee-Tellico silty clay loams:			
Eroded hilly phases	Low	Fair	Poor.
Severely eroded hilly phases	Very low	Poor	Do.
Clarksville cherty silt loam:			
Eroded hilly phase	Low	do	Do.
Hilly phase	do	do	Do.
Fullerton cherty silt loam:			
Eroded hill phase	do	do	Do.
Hilly phase	do	do	Do.
Fullerton cherty silty clay loam, severely eroded hilly phase.	Very low	do	Do.
Hermitage cherty silty clay loam:			

tically prohibits tillage in places. Runoff develops quickly on most areas, and consequently the soils are difficult to protect from erosion. Good tilth is also difficult to maintain, as the range of moisture conditions under which the plow layer can be cultivated without developing clods is very narrow. Most row crops are not well suited, but many of the legumes and grasses for hay and pasture are fairly productive where the fertility of the soils is at a high level. The yields of all crops, however, are restricted by unfavorable moisture conditions.

A large part of the area, especially that occupied by the severely eroded phases and stony types, is best used as permanent pasture. Where some row crops must be planted, moderately long rotations should be used. Large yields, however, cannot be expected of most row crops, because sufficient soil moisture for good growth during the drier parts of the growing period is not commonly available. Early maturing crops, as fall-sown small grains, can be expected to give more consistently good yields. Regular fertilization, application of lime, and the incorporation of organic matter are necessary to maintain a fairly good productivity. Where fertility is at a high level, alfalfa and red clover are fairly well suited to the better parts. In general these soils are well suited to the more desirable pasture plants, as Bermuda grass, annual lespedeza, white clover, and bluegrass. Adequate fertilization, liming, and proper seeding are necessary.

The fertility, workability, and conservability of the soils in management group 17 are given in table 23.

TABLE 23.—*Fertility, workability, and conservability of soils of*

waterlogged or ponded, but during the driest parts of the year most of them are excessively dry. The surface layer in general has good tilth, but the subsoil, especially of the Robertsville and Tyler types, is tight compact clay. The workability is poor, but the conservability is good as erosion is no hazard. The capacity for retaining plant nutrients in a form available to plants is high. Good tilth is somewhat difficult to maintain in many areas because the plow layer is much of the time either very wet or very dry.

Chiefly because of widely fluctuating moisture conditions, low fertility, and strongly acid condition, productivity is low. A few areas are fairly productive of certain crops, but in general they are best suited to permanent pasture or forest. Soybeans, corn, and sorghum for hay and forage produce fairly well during seasons of relatively favorable moisture conditions.

Fertilization is required for all crops, and the incorporation of organic matter is particularly beneficial. A pasture mixture of Dallis grass, annual lespedeza, and white clover is suited. In most areas Kentucky bluegrass, orchard grass, and Bermuda grass produce good grazing when the land is drained, brought to a high level of fertility, and adequately limed.

Special practices for the control of runoff are not required. The yields could probably be greatly increased by artificial drainage, but the feasibility of drainage depends upon finding suitable outlets and upon producing benefits which exceed the cost. Those soils that have a tight compact clay subsoil require intricate and probably costly drainage systems for effective removal of excess water.

The fertility, workability, and conservability of the soils in management group 18 are given in table 24.

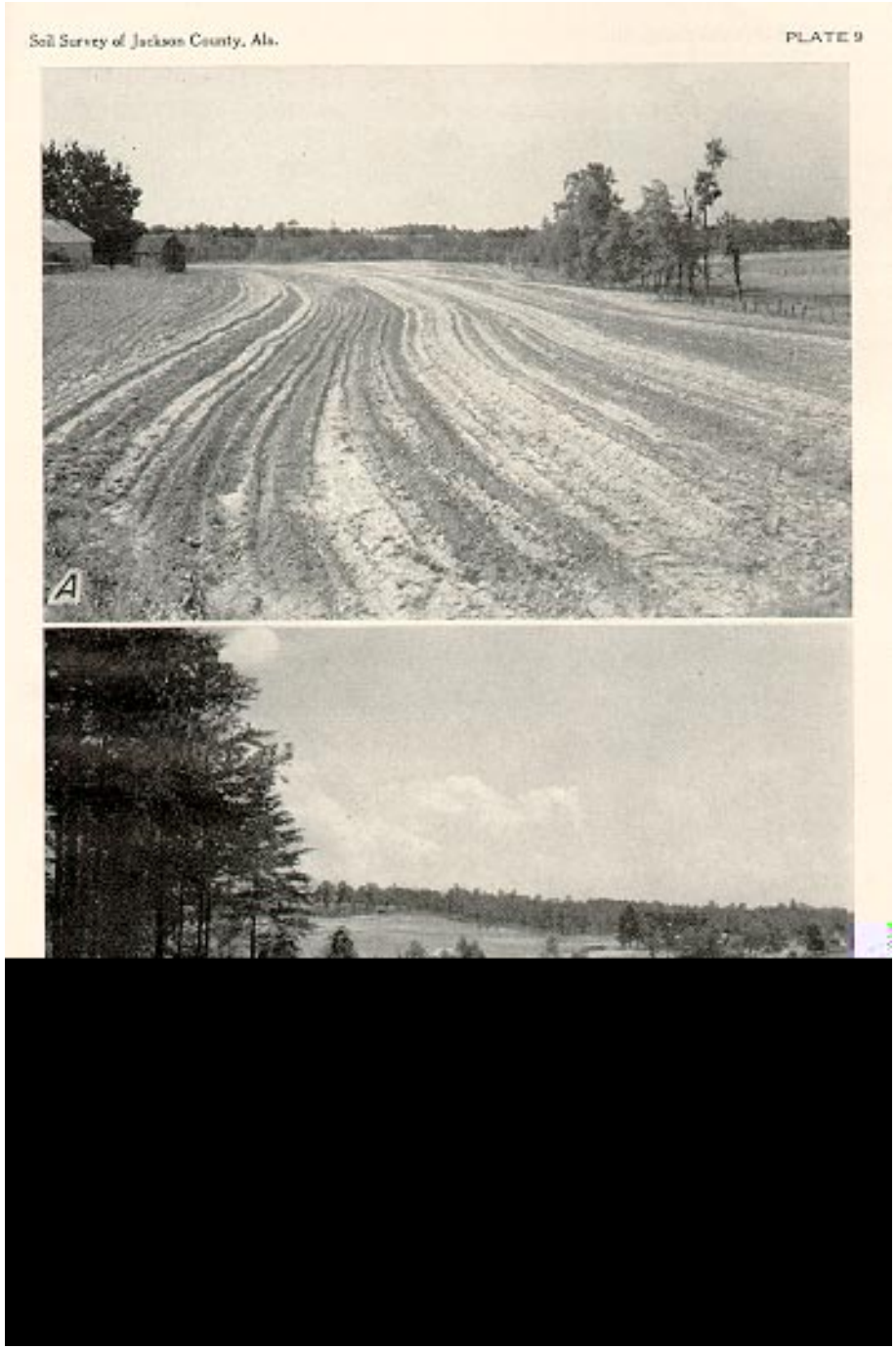
TABLE 24.—*Fertility, workability, and conservability of soils of Jackson County, Ala., in management group 18*

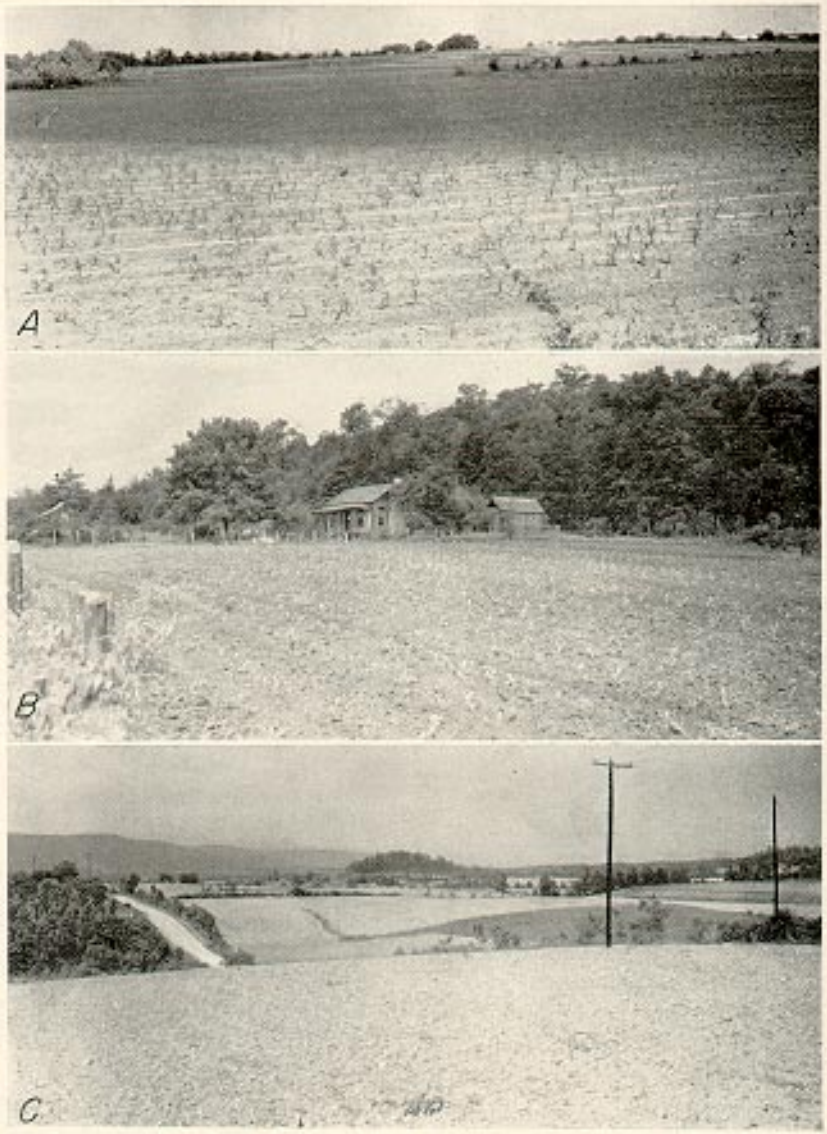
Soil	Fertility	Workability	Conservability
Guthrie silt loam	Low	Poor	Good.
Philo-Atkins silt loams	do	Good	Very good.
Robertsville silt loam	do	Poor	Good.
Tyler very fine sandy loam	do	do	Do.

GROUP 19

Group 19 is made up of slightly acid to alkaline poorly drained soils. The Hollywood soils have somewhat better drainage than the others, are not subject to flooding, and are suitable for crops. All the soils are fertile and have a very low lime requirement; a great part of the area does not require lime for either crops or pasture.

Owing to prevailingly wet conditions, the productivity is low for all except the better drained Hollywood areas. The generally wet condition and the heavy clayey nature of the plow layer causes Holly-





A, Lighter colored Colbert soils on the Etowah-Jefferson-Monongahela-Talbott soil association in foreground are shallower to bedrock and less productive than darker colored Hollywood soils in center.
B, Tenant home on Hollywood soils; wooded area of Limestone rockland (hilly) in background.
C, Landscape in the Fullerton-Clarksville-Greendale association; Fullerton silt loam, eroded rolling phase, in view.

makes their workability only fair. The problem of conserving Hollywood soils against erosion losses and leaching of plant nutrients is of practically no consequence. Areas on first bottoms may be subjected to scouring by stream overflow, and where row crops are grown on the more sloping parts of Hollywood silty clay, undulating phase, there may be some erosion during heavy downpours.

The Hollywood soils, especially the undulating phase, are productive of corn, soybeans, lespedeza, and certain other hay crops. They are suited to moderately short rotations, but yields are easily affected by either a shortage or excess of moisture. Cultivation is also difficult, as Hollywood soil clods easily except when worked within a narrow optimum range of moisture conditions. Fertilizer requirements are less than for most soils, although responses to proper fertilization can be expected. Lime is not commonly required even for the more exacting legume crops.

Most areas of the Melvin, Dunning, and Prader soils are poorly suited to crops requiring tillage. They support fair to very good pasture, although some areas are so wet that the pasture is of poor quality. For most soils of group 19 the productivity of crops and the quality of pasture can be improved by artificial drainage. The feasibility of drainage, however, depends on the finding of suitable outlets and the cost of installation.

The fertility, workability, and conservability of the soils in management group 19 are given in table 25.

TABLE 25.—*Fertility, workability, and conservability of soils of Jackson County, Ala., in management group 19*

Soil	Fertility	Workability	Conservability
Dunning silty clay	High	Poor	Excellent.
Hollywood silty clay:			
Level phase	do	Fair	Very good.
Undulating phase	do	do	Do.
Melvin silt loam	do	Poor	Excellent.
Melvin silty clay	do	Very poor	Do.
Melvin silty clay loam	do	Poor	Do.
Prader very fine sandy loam	do	do	Do.

GROUP 20

Miscellaneous land types and steep and stony soils form group 20

Old-field and Virginia pines are the trees most common on areas that were once cleared. They are also the most suitable trees for planting, especially on the less fertile soils and on the more exposed or otherwise less favorable growing sites. In the most exposed or infertile sites, Virginia pine is best suited, but it grows slowly and has a less commercial value than old-field pine. For the better locations, where moisture relations are most favorable for plant growth and the soil material is fairly fertile, yellow-poplar, walnut, locust, and other deciduous trees may be more desirable.

Management practices used in forest production include: (1) Maintenance of a full stand of desirable species; (2) systematic cutting and weeding out of undesirable trees; (3) harvesting of the mature trees so desirable species take their place; and (4) the control as far as possible of damage from fire, browsing, trampling, and other causes. Additional information on the establishment and maintenance of farm forests may be found in the handbook published by the Alabama Polytechnic Institute (*3*).

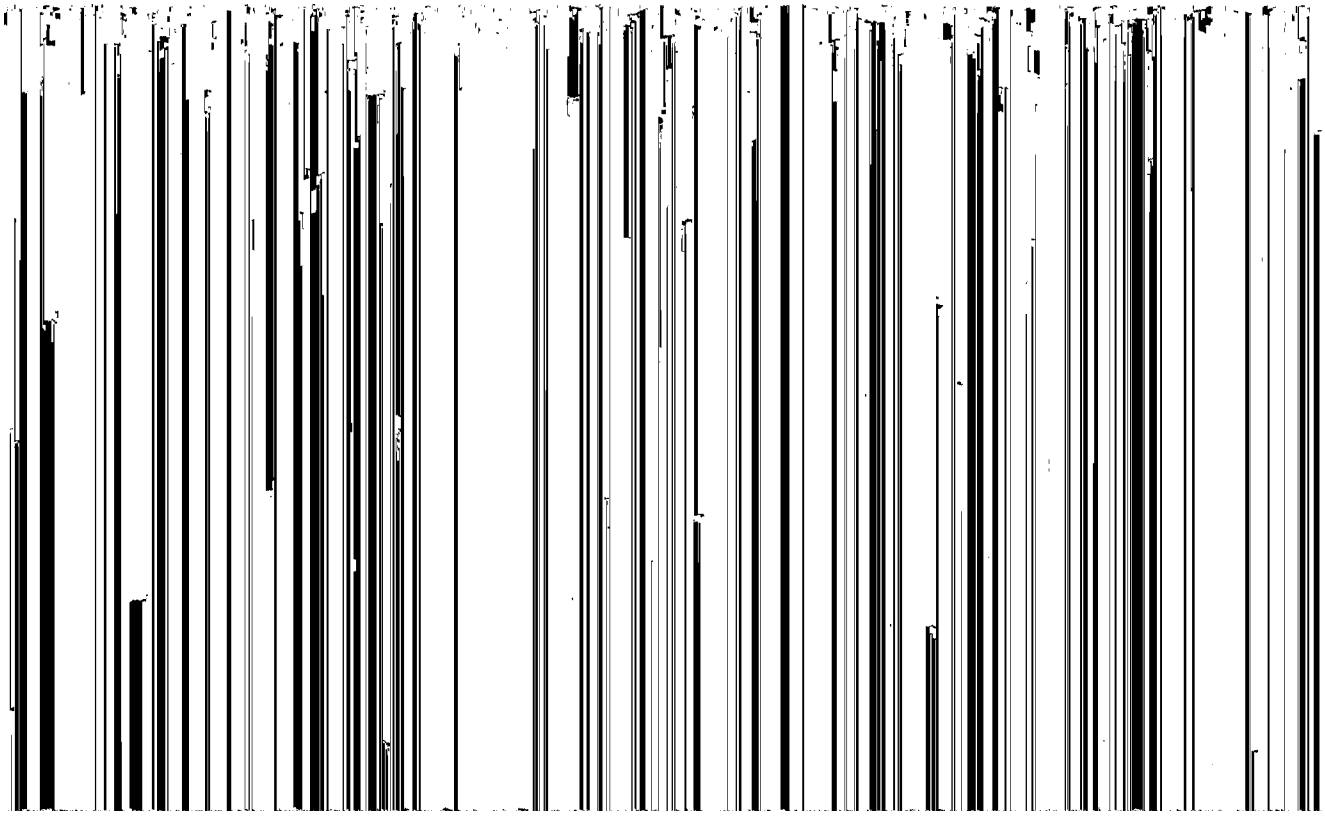
Sericea lespedeza is well suited for use in the establishment of a vegetative cover on many rough gullied areas, but it is generally difficult to get this crop established. Although the soils are not physically suited to cropping and pasture, farmers may be forced to use them for crops because they do not have any better land. Where tilled crops must be grown, adequate quantities of lime and fertilizer must be applied and the organic-matter content must be maintained at a high level. Rotations should consist as much as possible of close-growing hay, pasture, and small-grain crops. The soils must be maintained in a condition that will permit retention of as much moisture as possible. The goal must be reduction of runoff and development of a luxuriant vegetative cover that will hold the soil in place. All field operations should be with the contour, and on the longer slopes strip cropping may be beneficial. None of these soils can be terraced.

Productive pasture requires proper seeding, liming, and fertilizing, particularly with phosphorus. In general, legumes should make up a considerable part of the pasture sod. The difficulty of applying fertilizer and other amendments and clipping of weedy growth is the greatest problem in maintaining good pasture on these steep soils.

The fertility, workability, and conservability of the soils in management group 20 are given in table 26.

TABLE 26.—*Fertility, workability, and conservability of soils of Jackson County, Ala., in management group 20*

Soil	Fertility	Workability	Conservability
Aimuchee silty clay loam, eroded steep phase.	Low	Very poor	Very poor.
Fullerton cherty silt loam:			
Eroded steep phase	do	do	Do.
Steep phase	do	do	Do.
Hilly stony land (Muskingum soil material).	Very low	do	Do.
Jefferson-Allen loams:			
Severely eroded steep phases	do	do	Do.
Steep phases	Medium	Poor	Do.
Limestone rockland:			
Hilly	Very low	Very poor	Do.
Rough	do	do	Do.



Ala.

nty. Absence

	Pasture	
	B	C
	Cow-acre-days [1]	*Cow-acre-days* [1]
)	125	150
)	115	140
)	100	125
)	75	100
)	65	90
)	65	90
)	60	80
)	35	50
)	30	65
)	25	40
--	30	50
)	60	75
)	25	40
)	60	100
)	90	120
)	40	80
)	70	120
)	70	120
)	40	65
)	35	60
)	50	75
)	40	70
--	30	60
--	25	55
--	65	80
--	55	70

ating phase	160	240	13	20	15	25	.6	1.0	1.0	1.6	.6	.8							50	75
d undulating phase	120	200			13	25	.5	1.0											25	55
phase	140	240	10	18	10	25	.5	.9	.9	1.5	.5	.9							40	70
d rolling phase	120	180			10	23	.5	.8											30	60
ony silty clay loams, severely hases																			20	40
, undulating phase	320	400	25	38	25	38	1.2	1.5	1.3	2.4	.5	.8			113	150	100	130	75	100
oam:	360	500	38	50	38	50	1.5	1.7	1.8	2.5	.9	1.0	2.6	3.6	113	150	150	200	100	125
ase	360	520	38	50	38	50	1.5	1.7	1.8	2.5	.9	1.0	2.6	4.0	113	150	150	200	75	125
	320	440	30	45	30	45	1.0	1.3	1.6	2.3	.8	.9	2.2	3.6	105	128	140	180	60	100
clay loam:																				
ating phase	280	400	30	45	30	43	1.1	1.4	1.7	2.4	.8	1.0	2.2	3.2	113	135	140	180	75	100
phase	260	360	25	35	25	40	.9	1.1	1.4	2.0	.6	.9	2.0	3.0	90	120	130	160	60	90
d rolling phase [4]	200	260	15	30	10	25	.4	.9	.6	1.3	.3	.5	1.2	2.2					35	70
hase [4]	160	240	13	20	13	18	.5	.8	1.0	1.6	.4	.5	1.6	2.0					50	70
d hilly phase [4]					8	15													30	65
ase	360	500	33	50	35	50	1.5	1.7	1.8	2.5	.9	1.0	2.6	4.0	113	150	150	200	100	125
	300	400	30	45	25	45	1.0	1.3	1.6	2.3	.8	.9	2.2	3.6	105	128	130	160	75	100
	200	300	20	30	20	30	.8	1.2	1.1	1.8	.5	.8	2.0	3.4					60	90
oam:																				
ating phase	300	400	30	45	33	45	1.1	1.5	1.7	2.4	.8	1.0	2.2	3.2	105	135	140	180	75	100
phase	240	360	25	35	25	40	.9	1.4	1.4	2.0	.6	.8	2.0	3.0	98	128	120	140	60	100
d rolling phase	160	280	15	30	15	33	.5	1.1	.6	1.3	.4	.7	1.2	2.2					50	80
hase	160	280	15	25	15	25	.7	1.1	1.0	1.6	.5	.7	1.8	3.2					50	80
d hilly phase					10	20	.5	.9					1.5	2.0					40	70
loam:																				
ating phase	260	360	20	35	20	35	1.0	1.2	1.6	2.4	.7	.9	1.8	2.8	83	113	100	140	50	80
phase	240	320	18	30	18	28	.9	1.1	1.1	1.8	.7	.9	1.6	2.2	75	105	80	100	35	60
y clay loam, severely eroded	200	280	13	23	13	20	.5	1.1	.6	1.2	.4	.7	1.6	2.8					35	70
[5]			15	40			.7	1.0	1.1	2.3									70	130
	[2] 300	400	35	45	[3] 30	45	1.2	1.5	1.8	2.4	.8	.9	2.4	3.0	90	113	120	140	100	120
am	[2] 280	380	30	45	[3] 30	45	1.2	1.5	1.6	2.3	.8	.9	2.4	3.0	90	113	120	140	75	125
ase	280	400	23	35	25	30	.8	1.2	1.1	2.0	.5	.8	1.6	2.0	90	120	130	180	50	90
ating phase	240	360	15	30	20	30	.7	.8	1.0	1.8	.4	.7			75	105	120	150	45	80
	220	320	15	25	15	25	.6	.8	1.0	1.6	.4	.6			68	90	100	130	40	75
phase	220	280	15	25	15	25	.6	.8	1.0	1.6	.4	.6			68	90	100	130	40	75
w phase	180	240	8	20	10	20													40	75
shallow phase	160	200	8	15	8	15													35	70
	300	480	35	55	35	60	1.5	1.7	1.8	2.5	.9	1.0	3.0	3.6	120	165	180	220	110	140
ase	320	500	35	50	35	50	1.5	1.7	1.8	2.5	.9	1.0	2.6	3.6	120	165	180	220	110	140
ase	320	500	35	50	38	55	1.5	1.7	1.8	2.5	.9	1.0	2.6	4.0	120	165	170	220	110	140
	260	480	33	55	35	60	1.5	1.7	1.8	2.5	.9	1.0	2.6	4.0	113	150	170	200	100	140
	240	360	30	45	30	45	1.0	1.3	1.6	2.3	.8	.9	2.2	3.6	105	128	140	180	60	100

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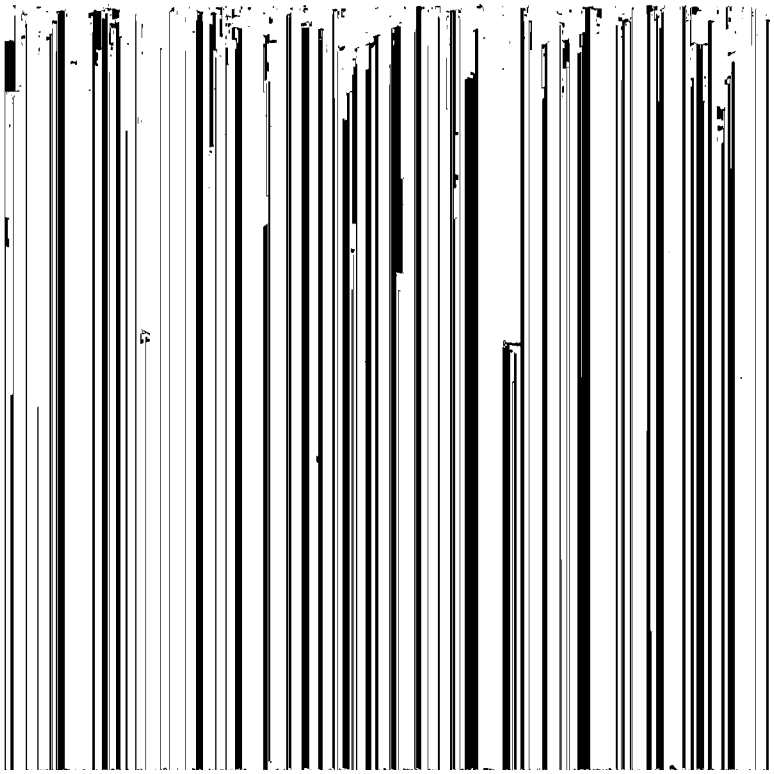


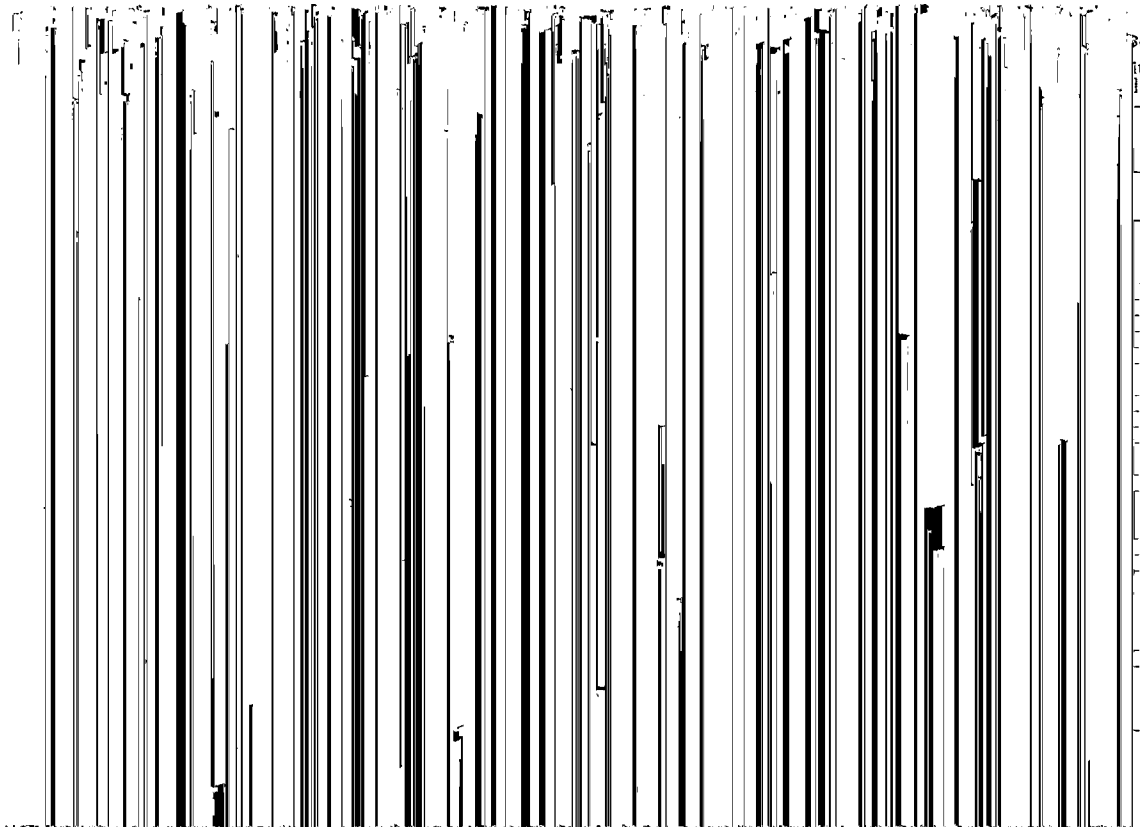
· *of management on the soils of Jackson County, Ala.*—Continued

est practices considered feasible for the majority of farmers in the county. Absence specified and is not commonly planted to it.]

eza	Soybeans		Cowpeas		Alfalfa		Sweet-potatoes		Potatoes		Pasture	
C	B	C	B	C	B	C	B	C	B	C	B	C
'ons	*Tons*	*Tons*	*Tons*	*Tons*	*Tons*	*Tons*	*Bu.*	*Bu.*	*Bu.*	*Bu.*	*Cow-acre-days* [1]	*Cow-acre-days* [1]
1.4	1.7	2.4	.8	1.0	2.2	3.2	113	135	140	180	75	100
1.1	1.4	2.0	.6	.9	2.0	3.0	90	120	130	160	60	90
.8	.6	1.3	.3	.5	1.2	2.2	----	----	----	----	40	80
1.4	1.3	2.3	.8	1.0	2.4	3.4	113	135	140	180	70	100
1.4	1.3	2.3	.7	.9	2.0	3.2	105	128	120	170	70	95
1.3	1.1	2.1	.6	.9	----	----	90	120	90	150	50	85
1.1	1.0	2.0	.7	.9	1.6	2.4	75	105	90	120	45	70
1.1	.9	2.0	.7	.9	1.6	2.2	75	105	80	100	35	60
1.0	.9	1.8	.7	1.0	2.0	3.2	90	120	120	160	60	80
1.2	1.1	2.1	.7	.9	1.6	2.8	83	113	100	140	50	75
1.0	.9	1.8	.5	.7	1.2	2.2	----	----	----	----	30	65
1.0	.9	1.8	.5	.7	1.0	2.0	----	----	----	----	30	60
----	----	----	----	----	----	----	----	----	----	----	30	45
----	----	----	----	----	----	----	----	----	----	----	25	45
1.0	.6	1.8	----	----	----	----	----	----	----	----	25	55
.8	.5	1.6	----	----	.8	1.8	----	----	----	----	25	55
1.2	1.3	2.1	.7	.9	2.0	2.2	90	120	140	180	80	100
1.1	1.3	2.1	.6	.9	1.6	2.1	68	113	120	170	75	95
1.2	1.3	2.1	.7	.9	2.0	2.4	90	120	140	180	80	100
1.1	1.1	2.0	.7	.9	1.4	2.0	60	105	70	100	60	75
.8	1.0	1.8	----	.5	----	----	----	----	----	----	60	100
.1	1.2	2.0	.4	.8	2.0	3.0	120	150	140	180	40	80
.1	1.2	2.0	.4	.7	1.6	2.6	105	143	120	160	35	75
.9	1.0	2.0	.4	.6	----	2.4	90	120	110	140	35	70
.8	1.1	1.9	.4	.6	----	2.0	75	105	100	130	35	65

andy loam:																			
g phase	400	520	38	50	20	30	.9	1.1	1.1	2.0	.5	.8	----	3.0	120	150	160	200	40	80
dulating phase	340	480	30	45	15	28	.8	1.1	1.1	2.0	.4	.8	----	2.8	105	135	120	180	35	80
ase	300	440	25	40	15	25	.7	.9	1.1	2.0	.4	.7	----	2.4	90	120	110	160	35	70
ling phase	260	400	20	35	15	23	.6	.8	1.0	1.9	.4	.6	----	2.0	75	113	100	140	30	70
g shallow phase	280	400	25	38	20	25	.8	1.1	.9	1.8	.5	.8	1.6	2.0	98	135	130	180	35	75
dulating shallow phase	260	340	23	35	18	23	.7	1.0	.8	1.7	.5	.7	----	1.6	75	113	110	150	35	75
allow phase	220	300	20	30	15	20	.7	.9	.8	1.7	.4	.7	----	1.6	60	98	70	120	25	70
ling shallow phase	180	260	18	25	13	18	.6	.8	.7	1.6	.4	.6	----	1.2	53	75	50	100	35	60
y clay loam:																				
dulating phase	340	440	40	50	38	45	1.4	1.7	1.8	2.4	.7	.9	2.6	3.6	120	135	160	180	110	130
ling phase	260	360	30	40	25	38	1.1	1.3	1.5	2.2	.6	.8	2.0	2.4	90	113	100	120	75	110
rty silty clay loam:																				
ly phase [4]	140	240	13	23	13	23	.7	1.0	1.0	1.9	.5	.7	1.0	2.0	----	----	----	----	40	70
oded hilly phase [4]	----	----	----	----	10	20	.5	.8	----	----	----	----	.8	1.8	----	----	----	----	25	55
nd (Muskingum soil material)	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----
y clay:																				
e	[3] 220	320	35	40	[3] 30	35	.8	1.0	1.8	2.4	.8	.9	----	----	----	----	----	----	70	100
g phase	[2] 280	360	38	45	[3] 35	40	1.1	1.2	1.8	2.4	.8	1.0	----	----	----	----	----	----	75	100
g phase	280	400	25	40	25	40	.8	1.1	1.1	2.3	.7	1.0	1.4	2.0	113	150	150	200	60	110
e	240	320	23	35	20	38	.8	1.2	1.3	2.3	.7	1.0	----	----	105	135	140	180	60	120
t loam	[2] 320	400	40	60	30	45	1.4	1.7	2.0	2.5	.9	1.0	2.4	3.2	120	135	140	160	125	150
andy loam:																				
g phase	300	400	30	40	25	40	.8	1.1	1.2	2.3	.7	.9	1.4	2.0	113	150	150	200	70	100
dulating phase	280	380	20	30	20	38	.7	1.0	1.2	2.3	.6	.8	1.2	2.0	105	135	130	170	60	100
ase	240	340	18	25	18	35	.7	1.0	1.1	2.0	.6	.8	1.4	1.8	105	135	120	160	60	90
ling phase	240	320	20	30	20	30	.6	.9	1.0	2.0	.5	.7	1.2	2.0	90	120	100	140	50	80
loams:																				
ling phases	240	320	18	25	18	25	.6	.9	1.0	2.0	.4	.6	1.0	1.6	75	120	100	----	50	80
es	140	280	13	20	13	23	.6	.8	.8	1.8	----	----	1.0	1.6	----	----	----	----	55	75
ly phases	120	240	13	20	13	20	.5	.8	.7	1.7	.4	.6	.8	1.4	60	90	60	100	30	55
oded hilly phases	----	----	----	----	10	15	.4	.7	----	----	.3	.5	.6	1.2	45	75	50	80	30	50
es	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	25	50
oded steep phases	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	25
dland:																				
----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----
----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----
am	[2] 280	400	45	50	[3] 25	30	1.2	1.5	2.0	2.5	.8	1.0	----	----	----	----	----	----	135	170
clay loam	----	----	40	45	[3] 25	30	1.1	1.4	2.0	2.5	.8	1.0	----	----	----	75	----	----	120	160
clay	----	----	35	43	20	28	1.1	1.2	1.8	2.3	.7	.9	----	----	----	----	----	----	100	120
m [5]	----	----	15	40	----	----	.9	1.2	1.8	2.3	.3	.6	----	----	----	----	----	----	80	140
ay loam [5]	----	----	16	35	----	----	.9	1.2	1.7	2.2	.7	1.0	----	----	----	----	----	----	80	140
ay	----	----	15	35	----	----	1.1	1.4	1.5	2.0	.8	1.0	----	----	----	----	----	----	80	140
oam:																				
e	200	280	15	25	18	30	.8	1.1	1.0	2.1	.6	.8	----	----	75	120	80	140	60	120
g phase	240	360	15	25	20	35	.8	1.1	1.0	2.1	.6	.8	----	----	90	128	100	150	60	120
ne sandy loam:																				
e [4]	200	240	15	23	----	----	.5	.8	.6	1.4	----	----	----	----	----	----	----	----	40	50
ly phase [4]	200	240	15	23	----	----	.5	.8	.5	1.3	----	----	----	----	----	----	----	----	35	50

tes at end of table.



son County, Ala.—Continued

ity of farmers in the county. Absence

Sweet-potatoes		Potatoes		Pasture	
B	C	B	C	B	C
Bu.	*Bu.*	*Bu.*	*Bu.*	*Cow-acre-days*	*Cow-acre-days* [1]
				15	30
				20	40
				125	150
				80	120
				80	120
				35	60
				35	60
				60	110
				60	100
				40	60
				25	40
				10	50
				10	20
113	165	160	200	80	110
113	165	160	210	80	120
				40	75
				100	130
60	90	70	100	70	100
45	75	60	100	50	70
				30	50
90	105	100	120	90	125
60	90	70	100	70	100
45	75	60	120	70	110
75	105	100	140	60	120

Talbott silty clay loam:																			
Eroded undulating phase	160	320	20	40	25	35	.9	1.1	1.3	2.2	.7	.8		2.4	45	75	60	160	50	100
Eroded rolling phase	120	240	15	30	18	30	.8	1.0	1.1	2.0	.6	.8		1.6	38	60	50	80	45	90
Severely eroded rolling phase	80	200	10	18	10	18	.3	.5	.5	1.1	.2	.4							30	50
Tellico clay loam:																				
Eroded rolling phase	280	360	18	30	25	35	.9	1.2	1.1	2.0	.6	.8		2.4	75	98	80	120	60	85
Severely eroded rolling phase	200	280	13	25			.6	1.1	.6	1.2									50	75
Tupelo silt loam:																				
Level phase			8	25	13	25	.8	1.0	.9	2.0	.5	.8							60	100
Undulating phase [5]	200	320	15	30	[3] 20	30	.9	1.1	.9	2.0	.6	.9							60	100
Tyler very fine sandy loam [5]			8	20	(3)		.6	1.1	1.0	1.8	.4	1.0							55	95
Waynesboro fine sandy loam:																				
Undulating phase	360	460	35	45	38	50	1.2	1.5	1.6	2.4	.9	1.1	2.6	3.6	128	165	160	200	80	110
Eroded undulating phase	340	420	30	40	33	45	1.1	1.4	1.6	2.4	.8	1.0	2.2	3.2	113	150	140	180	70	100
Rolling phase	320	400	28	38	30	43	1.1	1.4	1.5	2.3	.8	1.0	2.2	3.2	113	135	140	180	70	100
Eroded rolling phase	280	360	23	33	25	38	.8	1.2	1.5	2.3	.7	.9	1.6	2.6	98	120	120	180	60	90
Eroded hilly phase	160	240	13	20	10	25	.4	.9	1.0	1.6	.4	.6	1.2	2.0					40	70
Waynesboro loam, severely eroded rolling phase	160	280	15	25			.8	1.1	.5	1.2									30	60
Wolftever silt loam:																				
Level phase	260	360	30	40	35	45	1.0	1.5	1.5	2.3	.8	1.0	2.0	3.0	75	105	80	120	100	120
Undulating phase	300	400	25	35	33	43	.9	1.4	1.4	2.2	.8	1.0	2.0	2.4	60	90	80	120	90	115

[1] Cow-acre-days, used to express the carrying capacity of pasture land, is the product of the number of animal units carried per acre multiplied by the number of days during the year that animals can be grazed without injury to the pasture; for example, a soil type able to support 1 animal unit per acre for 360 days of the year rates 360; a soil supporting 1 animal unit on 2 acres for 180 days rates 90; and a soil supporting 1 animal unit on 4 acres for 100 days rates 25.

[2] Crop not commonly planted because soil is better suited to other crops and has a high organic content that causes rank growth and late maturity.

[3] Not commonly planted because of danger from freezing, flooding, and lodging.

[4] Yields obtained on selected areas with milder slopes.

[5] Yields obtained on artificially drained or naturally better drained areas.

The yield data in columns B are based largely on observation, interviews, and experience of local farmers and agricultural workers. Crop yield data by soil types over a long period of years are used wherever available. The summation of experience will give fairly reliable yield expectations under the commonly practiced management. For the soils for which such information was not available, the expectable yields given are assumed to be about the same as those for soils with similar characteristics for which there was information.

Information regarding common management for most crops is given for the separate soils in the section on Soil Types and Phases, but common management for permanent pasture is discussed in less detail. Some general definition of common management for per-

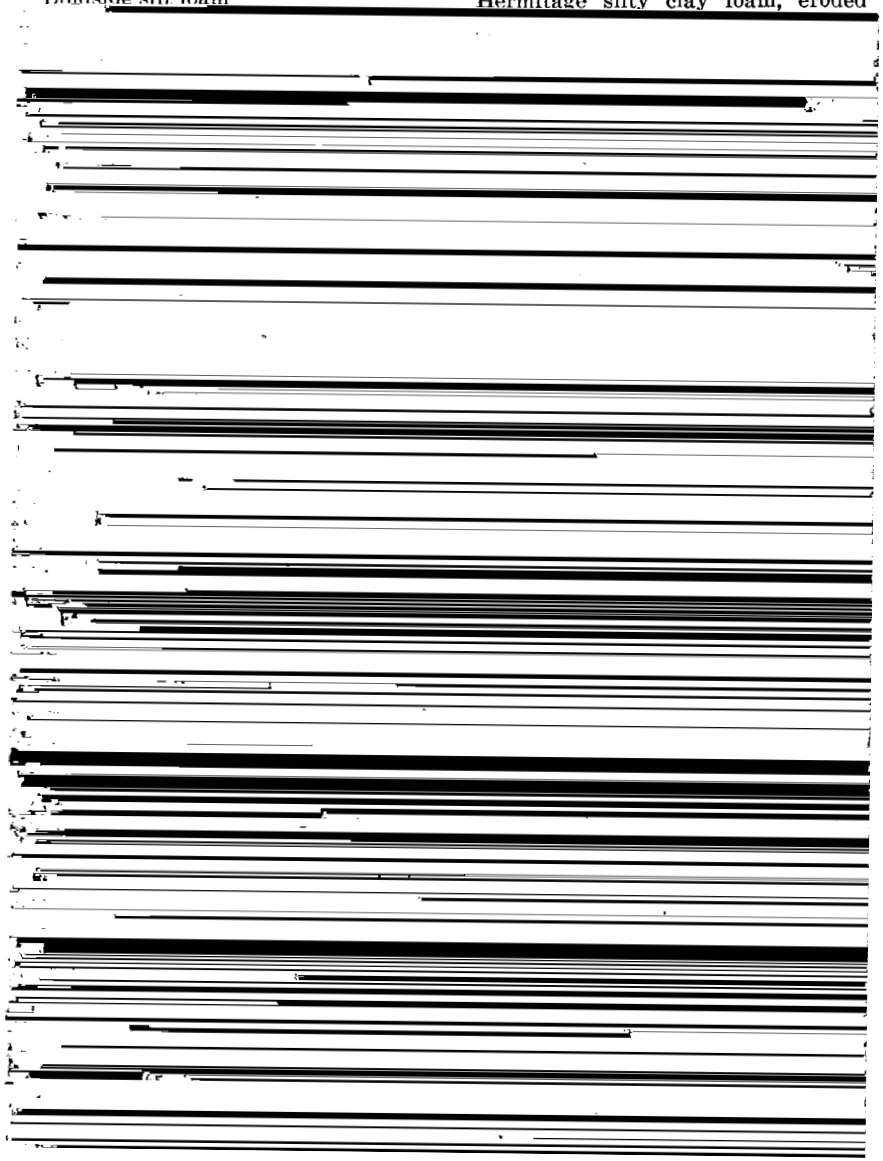
according to suitability for use follows under the heading Suitability Classes.

SUITABILITY CLASSES

The soils of the county can be grouped as First-, Second-, Third-, Fourth-, and Fifth-class soils according to their relative suitability for agricultural use. Such a grouping is not a key to the actual agricultural value of the soils, because location of individual soil areas,

SECOND CLASS—Continued
- Hermitage silty clay loam, eroded undulating phase
- Hollywood silty clay, undulating phase
- Holston loam:
  - Level phase
  - Undulating phase
- Jefferson fine sandy loam:
  - Eroded undulating phase
  - Undulating phase
- Lindside silt loam

THIRD CLASS—Continued
- Greendale cherty silt loam, eroded rolling phase
- Hanceville fine sandy loam, eroded rolling phase
- Hartsells fine sandy loam:
  - Eroded rolling phase
  - Eroded rolling shallow phase
  - Eroded undulating shallow phase
  - Rolling shallow phase
  - Undulating shallow phase
- Hermitage silty clay loam, eroded



FOURTH CLASS—Continued
- Dewey silt loam, hilly phase
- Dewey silty clay loam:
  - Eroded hilly phase
  - Severely eroded hilly phase
- Dunning silty clay
- Fullerton cherty silt loam:
  - Eroded hilly phase
  - Eroded rolling phase
  - Hilly phase
- Fullerton cherty silty clay loam:
  - Severely eroded hilly phase
  - Severely eroded rolling phase
- Guthrie silt loam
- Hermitage cherty silty clay loam:
  - Eroded hilly phase
  - Severely eroded hilly phase
- Jefferson-Allen loams:
  - Eroded hilly phases
  - Hilly phases
  - Severely eroded hilly phases
- Melvin silt loam
- Melvin silty clay
- Melvin silty clay loam
- Muskingum fine sandy loam:
  - Eroded hilly phase
  - Hilly phase
- Pottsville loam:
  - Eroded hilly phase
  - Hilly phase
- Prader very fine sandy loam
- Robertsville silt loam

FOURTH CLASS—Continued
- Rolling stony land (Colbert soil material)
- Stony alluvium (Muskingum and Colbert soil materials)
- Tyler very fine sandy loam
- Waynesboro fine sandy loam, eroded hilly phase

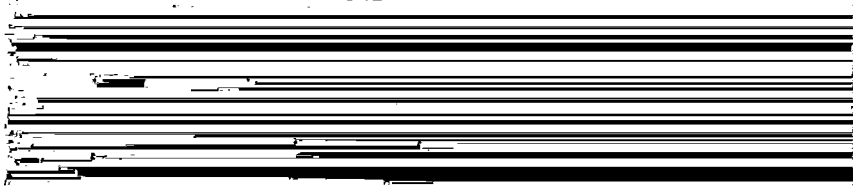
FIFTH CLASS:
- Armuchee silty clay loam, eroded steep phase
- Fullerton cherty silt loam:
  - Eroded steep phase
  - Steep phase
- Hilly stony land (Muskingum soil material)
- Jefferson-Allen loams:
  - Severely eroded steep phases
  - Steep phases
- Limestone rockland:
  - Hilly
  - Rough
- Muskingum stony fine sandy loam:
  - Hilly phase
  - Steep phase
- Rolling stony land (Muskingum soil material)
- Rough gullied land:
  - Dewey, Cumberland, and Colbert soil materials
  - Muskingum soil material
- Rough stony land (Muskingum soil material)

SOIL ASSOCIATIONS

Soils tend to occur in characteristic geographic association. The Fullerton soils, for example, are generally associated with the Clarksville and Greendale. The Huntington soils are usually associated with Lindside and Egam soils of the first bottoms. Such geographic groups of soils are called soil associations. A soil association may contain few or many soils, and these soils may be nearly similar or they may differ greatly. In each soil association area, however, the same combination of soils occurs repeatedly throughout the area. Two soils may be closely associated and yet be wholly different in their suitability for agricultural use.

The association in which a soil occurs may have great influence on its use. If a soil suitable for corn, for example, is associated with other soils equally suitable for corn, much less of it may need be used for corn than if it were associated with soils unsuited to that crop.

Seven soil associations are recognized in Jackson County. Each association is separately discussed in the following, and the location it occupies is shown on the small map inset on the soil map.



Crossville soils occupy all of the smoother parts, and the soil material is 20 to 50 or 60 inches thick. The Muskingum soil material on the steeper slopes is shallow to bedrock, and sandstone outcrops in places. Narrow strips of the Barbourville-Cotaco and Philo-Atkins complexes are along the larger drainways, but the proportion of the asso-

The most fully settled areas, in the vicinities of Higdon and north of Flat Rock, have cotton, corn, and hay as the principal crops. Some land is planted also to potatoes. Truck farms and a few small orchards occupy some of the association. Little livestock other than enough for home use is raised.

Much of the Enders and Hartsells soils in this association area is suitable for crops requiring tillage. These soils are relatively low in fertility, somewhat shallower to bedrock than the Hartsells soils of the Hartsells-Crossville-Muskingum association, and somewhat more subject to erosion. They respond well to proper management, how-

pasture, and a great many are suited to a wide variety of crops, although the nature of the soil pattern varies from place to place. Legume and grass hay, pasture crops, small grains, soybeans, corn, and cotton are among the well-suited crops. Where adequate fertilization is practiced on the better drained soils, alfalfa can be expected to produce well. Management is not now at a sufficiently high level to maintain the general productivity. Erosion is active on many of the more sloping areas, and crop yields are not high. Better choice of crops and rotations, increased use of fertilizers and lime, and better supplementary means of controlling runoff on the more sloping parts are some of the good management measures.

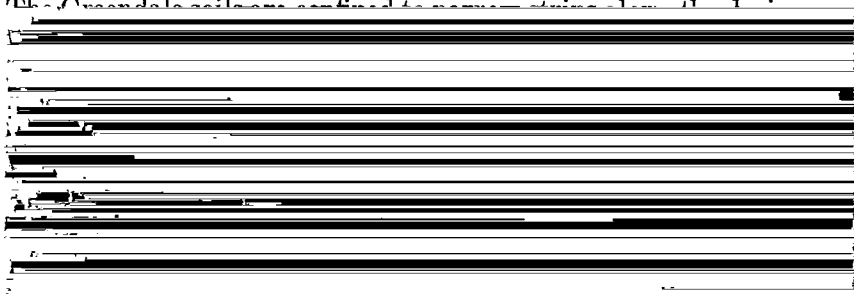
HUNTINGTON-LINDSIDE-EGAM ASSOCIATION

The Huntington-Lindside-Egam association in general occupies the nearly level better-drained first bottoms. The soils are very fertile, easily worked, and present no serious conservation problems. Accordingly, this association is better suited to intensive use for row crops than any of the others. The aggregate area is limited, however, and the separate tracts are small. They are widely distributed on the first bottoms of the larger streams of the limestone valley section. Some of the largest areas are adjacent to the Tennessee River and along the Paint Rock River.

Practically all of this association is cleared, and a great part of it is used for row crops. Corn and hay predominate, but cotton is a common crop on some of the better drained higher lying areas. In general, however, the acreage in corn is by far greater than that in all other crops. Little or no fertilizer is used for corn or hay on those parts subject to periodic flooding. Cotton, which is generally grown on those areas not commonly subject to flooding, is fertilized regularly. Some fall-sown grains are grown on areas infrequently flooded, and these are commonly fertilized with 100 to 200 pounds of nitrate of soda an acre. Most of the acreage is especially well suited to improved pastures, but because these soils normally give high yields of corn without fertilizer, only the more poorly drained or less accessible areas are used for pasture. In many localities, farmers who have a considerable acreage of this association specialize in livestock. They usually raise beef cattle and hogs and use the soils for grain feed crops.

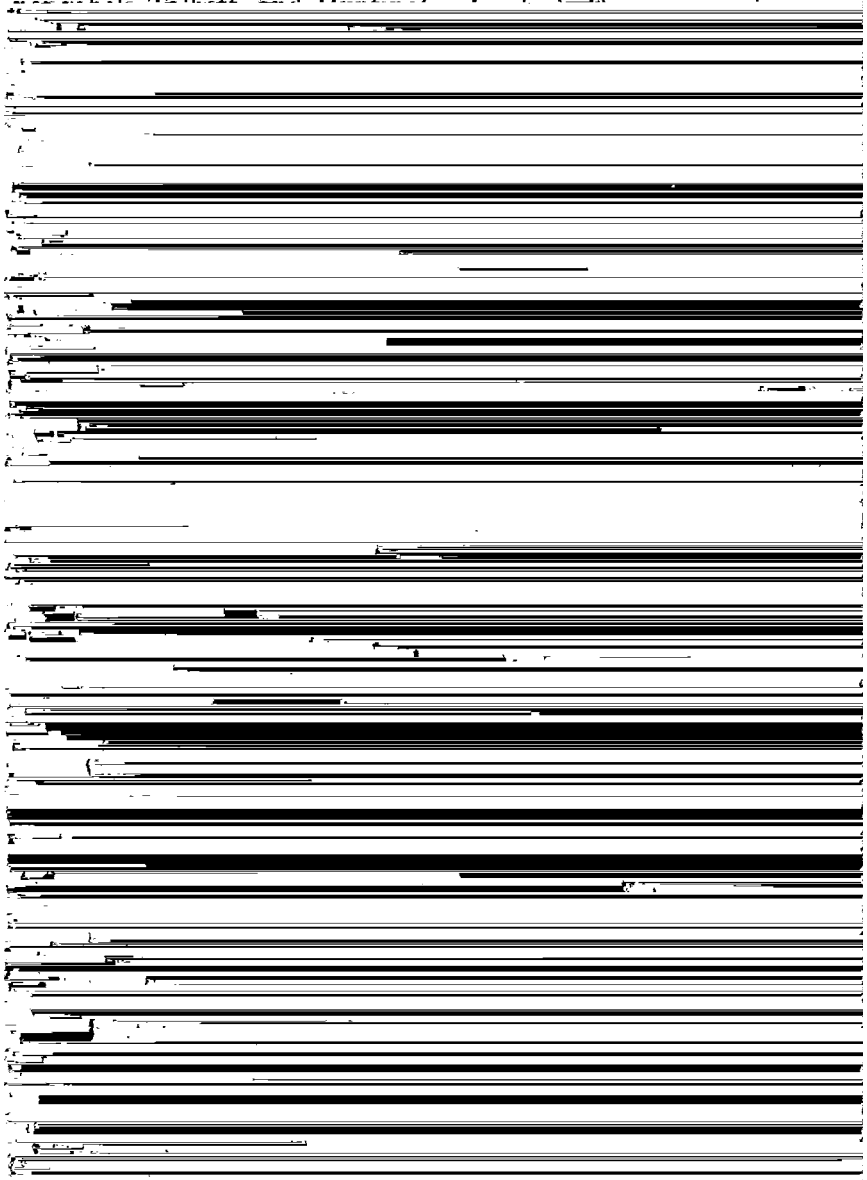
FULLERTON-CLARKSVILLE-GREENDALE ASSOCIATION

The Fullerton-Clarksville-Greendale association, composed chiefly of Fullerton (pl. 10, *C*) and Clarksville soils, occupies cherty ridges.



hilly parts, areas have been cleared and cropped but are now either under a volunteer shortleaf-pine forest or are used as unimproved pasture. Some of the strongest slopes are still in native forest.

Farms range from small to medium in size, although some are part of large holdings that include soils of other associations. Some of the small farms are of the subsistence type, but most of them are of a general type. Cotton, corn, and hay, chiefly lespedeza, are the principal crops. Management is not at a high level, and yields are lower than on the Hartsells-Crossville-Muskingum, Etowah-Jefferson-Mo-



Corn, soybeans for hay, and grain sorghum are the chief crops grown on areas sufficiently well drained to warrant their use as cropland. Lespedeza and redtop are also among the better suited crops for these areas suitable for cultivation. Much of this association is well suited to improved pasture where adequate fertilization and proper seeding are practiced. Some of the most poorly drained areas, however, do not support useful pasture vegetation and therefore are of little value except for forest.

ROUGH STONY LAND ASSOCIATION

The Rough stony land association consists chiefly of the steep stony mountain slopes that lie between the higher sandstone plateaus and the lower lying limestone valleys. In general, the depth of the soil material is very slight. Rock outcrops and loose stone abound. The upper parts of the slopes consist chiefly of sandstone rock and material weathered from it, and the lower parts, limestone rock and material from it. A few small irregular benches along the upper edge of the limestone materials are occupied by soils of sufficient depth and smoothness to be suitable for pasture or crops.

Much of this association is in forest. The upper slopes have deciduous hardwoods, mainly oak, hickory, yellow-poplar, persimmon, and buckeye, with some pine intermixed. The lower slopes, or parts underlain by limestone, are grown up in many places with solid stands of red cedar and in other places by deciduous hardwoods. The small benches of arable land on the mountain slopes are cleared and used for a subsistence type of farming where access has been gained to them. Practically all the area has been cut over from time to time. The subsistence farms on the small included benches are occupied mainly by families of coal miners, operators and employees of small sawmills, and by families who prefer isolation.

FORESTS

The early settlers throughout this part of the Tennessee River valley found it heavily forested except for occasional small open or partly open areas in the limestone valleys. Such areas probably had been cleared and kept open by the Indians for their village sites, recreational grounds, and for growing corn and other tilled crops. Early reports mentioning the heavy stands of timber give little definite information as to the dominant varieties of trees, the topographic positions occupied by the different varieties, or the purity of the stands. Much of the timber in excess of that needed in the construction of the first houses, barns, and other shelters or for fuel was burned to clear the land for crops. No markets were available where even choice logs or other timber products could be disposed of at a profit.

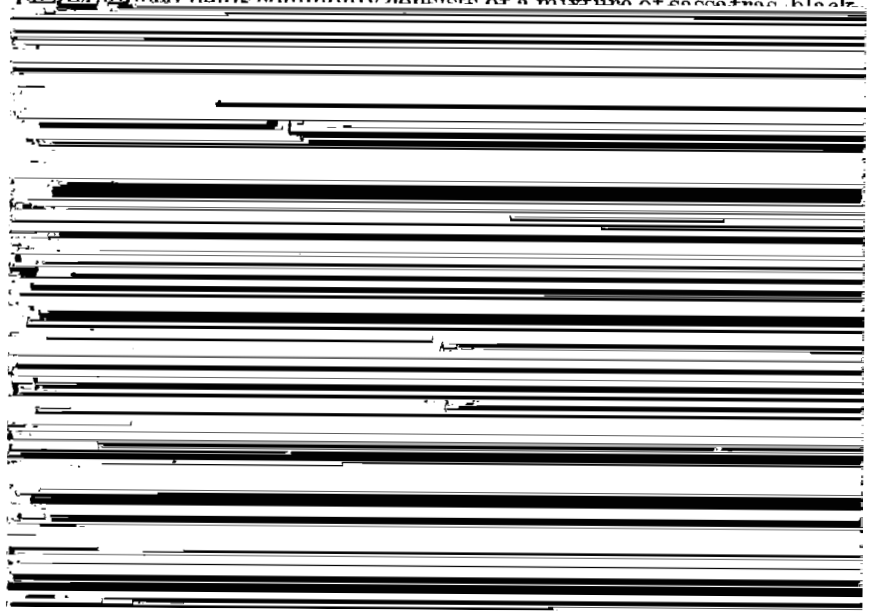
Early writers reported deciduous hardwoods as being dominant in practically all areas except the lower rough limestone slopes and the isolated knolls of limestone outcrops, which were covered by nearly solid stands of red cedar. From information based on later observations it is probable that fairly solid stands of pine occurred on some of the well-drained positions in the limestone valleys and that some pine was common among the deciduous hardwoods on the sandstone plateaus. On the rough stony slopes were giant chestnut trees and many

tall yellow-poplars and oaks. Travel in the valleys was difficult because of the dense underbrush of young saplings, vines, and briers, whereas it was relatively easy to travel by cart, wagon, horseback, or on foot through forests on the plateaus. On the plateaus deer, turkeys, other game, and wild animals could be seen at fairly great distances because of the absence of underbrush.

No areas of virgin forest remain in the county, although access to some parts of the rough stony lands and some isolated or nearly isolated sandstone plateaus is difficult. Nearly all the stony lands, large areas of the sandstone plateaus, and poorly drained locations in the limestone valleys have never been completely cleared of forest vegetation. All the county has been cut over at some time.

The principal trees of commercial value are black, post, white, Southern red, laurel, Spanish, chestnut, and willow oaks, scaly-bark and pignut hickories, beech, redgum, blackgum, persimmon, yellow-poplar, and red cedar. Of less extent but nevertheless of commercial value are black walnut, basswood, maple, cherry, ash, and black locust. In other places old-field or loblolly, shortleaf, and scrub or Virginia pines are the chief conifers. Before being killed by the blight in the early thirties, chestnut was widely distributed over the county and was among the largest, most common, and most valuable trees. Many slopes and some plateau ridges are still studded by gigantic dead chestnut trees, some of which are 60 to 80 feet tall to the first limbs. Other common but less useful trees are red and white elms, sourwood, dogwood, blackjack oak, willow, sycamore, redbud, honeylocust, hackberry, plum, and buckeye. Holly and sassafras are common in places.

Grape, rattan, and ivy are common vines that together with blackberry, greenbriers, saw briers, and other prickly vines and shrubs entangle the less dense forest areas as well as some of the abandoned open areas. Honeysuckle, mountain-laurel, rhododendron, roses, yellow jasmine, and wild crab apple are common. Voluntary vegetation on abandoned fields commonly consists of a mixture of sassafras, black-



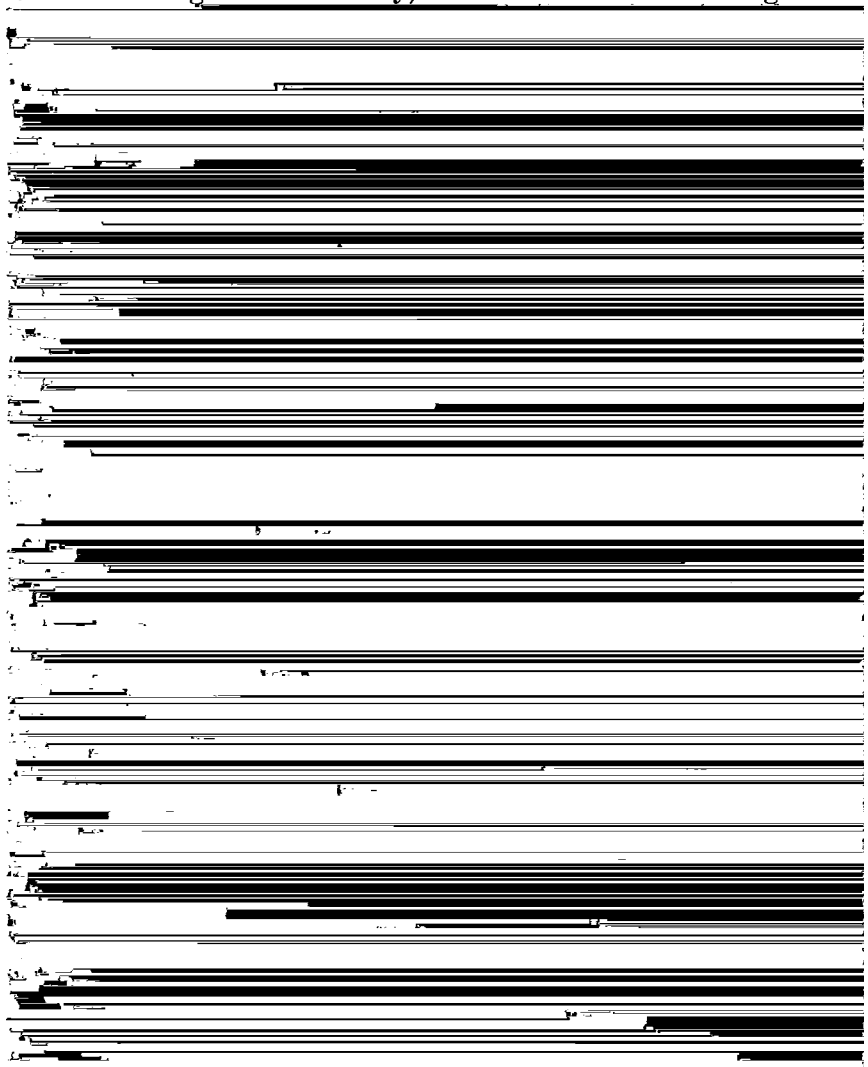
Prior to January 1942, about 4,350 acres, mostly severely eroded areas and land otherwise not suitable for cultivation or pasture, had been planted with forest seedlings. Of these seedlings about 65 percent were loblolly, slash, and shortleaf pines, and about 35 percent were black locust, ash, and sweetgum or redgum. A few black walnut and yellow-poplar trees and, as an experiment, a few longleaf pine and chestnut trees have also been set out. Much of the acreage was planted to forest by Civilian Conservation Corps personnel in cooperation with the Tennessee Valley Authority. The rest was planted by the individual landowners, most of the trees being obtained through the Tennessee Valley Authority.

The necessary preparation of the soil for planting trees varies according to the condition of the site. Fertile permeable areas require little preparation other than planting the trees and possibly protecting them from competitive weedy growth. Open bald areas, however, may require breaking, some fertilization, and mulching. Sites on sidehills may require contour furrows in which to set the trees, and suitable preparation of gullies may require the construction of low brush check dams. It may be difficult to establish trees on some of these more severely eroded cleared areas, and plants such as kudzu or honeysuckle may be more useful in establishing a vegetative covering that will arrest erosion. Possibly 1 percent of the forest land consists of abandoned areas formerly cropped that have returned by voluntary reseeding to forest vegetation consisting principally of pine, persimmon, sweetgum, and cedar.

The Division of Forestry of the State of Alabama maintains a

material; (2) the climate under which the soil material has accumulated and has 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 development have acted on the material.

Climate and vegetation are the active factors of soil genesis. They exert their influence on the parent material and change it from a heterogeneous mass of inert material to a body that has definite genetic morphology. The effects of climate and vegetation on the parent material are guided, or limited, to varying degrees by the modifying influence of relief as it affects conditions such as drainage, quantity of water that percolates through the soil, rate of natural erosion, and vegetation growing on the soil. The nature of the parent material itself also guides the course of action that results from the forces of climate and vegetation. Finally, time is involved in the changes that



outcrops along the eastern side of the valley and exposing the lowermost formations as parallel strips along the main axis of the valley.

The soils developed from residual material are generally associated with particular rock formations or parts of particular rock formations. Soils of the Hartsells, Hanceville, Crossville, and Muskingum series are commonly associated with sandier parts of the Pottsville formation of the Pennsylvanian rock system, whereas those of the Enders and Pottsville series are commonly associated with the more shaly parts. The stony land types of limestone material are closely related to the Bangor limestone (restricted) of the Mississippian system. The Fullerton series is associated in the Paint Rock River valley with the Tuscumbia limestone (Warsaw limestone) and Fort Payne (Lauderdale) chert of the lower part of the Mississippian system.

The Talbott and Colbert soils and some stony land types are associated with the Tuscumbia limestone, and the Tellico and Armuchee soils are associated with the Red Mountain formation of the Silurian system. Talbott, Colbert, and Dewey soils are associated with the Chickamauga limestone of the Ordovician system, and the Fullerton and Clarksville series are associated with the Longview limestone formation of the Lower Ordovician or Upper Cambrian system. Dewey soils may be associated with higher grade parts of the Longview limestone. The various rock formations are arranged in accordance with the geologic column by Adams and others (*1*).

Among the soils consisting of transported material, the nature of the parent rock is reflected in some of their characteristics. Soils of the [illegible]

stone valleys. The growing season is almost 20 days shorter, and the soil is frozen for longer periods on the plateaus than in the valleys. Some of the differences between the soils of the plateaus and those of the limestone valleys are no doubt due to these climate differences, but they are also associated with marked differences in parent material. The separate influences of the two factors have not been determined. The differences arising from climatic differences are subordinate to those arising from differences in parent material. The climate of the limestone valleys is relatively uniform from place to place, as is also that of the plateaus. Within each of those areas, differences of climate can account only in part for some of the outstanding common characteristics of many of the soils.

Higher plants, micro-organisms, earthworms, and other forms of life live on and in the soil and contribute to its morphology. The nature of the changes they 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, as a determinant of the kinds of higher plants that grow on the well-drained well-developed soils. In this way climate exerts a powerful indirect influence on the morphology of soils. Climate and vegetation acting together are the active factors of soil genesis.

The natural vegetation on the well-drained well-developed soils was predominantly deciduous hardwoods, chiefly oak, chestnut, and hickory, with some pine intermixed. There were probably differences in the density of stands, the relative proportions of species, and the associated ground cover. Some of the greater differences in these respects were between the forest of the plateaus and that of the limestone valleys, not only because of differences in climate but also because of differences in the kind of soil that developed. Few marked differences in morphology among the well-drained well-developed soils are directly the result of differences in the vegetative cover, however.

earthworms, and other population of the soil, but their importance is probably no less than that of the higher plants.

The well-drained well-developed soils have been formed under relatively similar conditions of climate and vegetation. On these soils climate and vegetation have had the maximum of influence with the minimum of modification by relief and age. As a result, the soils developed from various kinds of parent material have many

are constantly renewed or mixed and the changes brought about by vegetation and climate may be so slight that the soils are essentially AC, or azonal, soils.

On some nearly level areas in the county where both internal and external drainage are restricted or where geologic erosion is very slow, soils formed of materials that 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 and are called intrazonal soils (*7*). They are defined as soils that have characteristics that are more or less well developed and reflect the dominating influence of some local factor of relief or parent material over the normal effects of climate and vegetation (*13*). The characteristics of such soils in this county 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.

TABLE 28.—*Classification of the soil series of Jackson County, Ala., by higher categories and some of the factors that have contributed to differences* [1] *in soil morphology*

ZONAL SOILS

Great soil group and series	Relief	Parent material
Red-Yellow Podzolic soils:		
Red members:		Eluvium from weathering of—
Dewey	Undulating to hilly	High-grade dolomitic limestone.
Fullerton	do	Cherty dolomitic limestone.
Talbott	Undulating to rolling	Argillaceous limestone.
Tellico	do	Shale, sandstone, and limestone mixed.
Hanceville	do	Sandstone and conglomerate.
		Colluvium consisting of material derived from—
Hermitage	Gently sloping to strongly sloping.	Limestone.
Swaim	Gently sloping to moderately sloping.	Argillaceous limestone.
Allen	Undulating to hilly	Sandstone and some limestone and shale.
		Alluvium consisting of material derived from—
Cumberland	do	Limestone and some sandstone and shale.
Etowah	Nearly level to rolling.	Do.
Waynesboro	Undulating to hilly	Sandstone, shale, and limestone.
Sequatchie	Nearly level to undulating.	Sandstone and some shale and limestone.
Yellow members:		Eluvium from weathering of—
Clarksville	Undulating to hilly	Cherty dolomitic limestone.
Colbert (lithosolic).	Undulating to rolling	Agillaceous limestone.
Hartsells	Nearly level to rolling.	Sandstone.
Enders	Undulating to rolling.	Shale and sandstone.
Crossville	Undulating	Sandstone and some shale.
		Colluvium consisting of material derived from—
Greendale	Gently sloping	Cherty limestone.
Jefferson	Undulating to hilly	Sandstone and some shale and limestone.
		Alluvium consisting of material derived from—
Holston	Nearly level to undulating.	Sandstone and some shale and limestone.
Capshaw	Nearly level to gently	Limestone and some sandstone

TABLE 28.—*Classification of the soil series of Jackson County, Ala., by higher categories and some of the factors that have contributed to differences* [1] *in soil morphology*—Continued

INTRAZONAL SOILS

Great soil group and series	Relief	Parent material
Humic Gley soils:		
Hollywood	Nearly level to gently sloping.	Colluvium consisting of material derived from argillaceous limestone.
Planosols:		Alluvium consisting of material derived from—
Wolftever	Nearly level to gently rolling.	Limestone and some sandstone and shale.
Tupelo	Nearly level to gently undulating.	Argillaceous limestone and some sandstone and shale.
Taft	Nearly level	Limestone and some sandstone and shale.
Robertsville	do	Do.
Monongahela	Nearly level to undulating.	Sandstone and some shale and limestone.
Tyler	Nearly level	Do.

AZONAL SOILS

Lithosols: [2]		Eluvium from weathering of—
Armuchee	Hilly and steep	Shale, sandstone, and limestone mixed.
Muskingum	do	Sandstone and some conglomerate and shale.
Pottsville	do	Shale and some sandstone.
Alluvial soils:		Colluvium consisting of material derived from—
Abernathy	Nearly level and very gently sloping.	Limestone.
Ooltewah	Nearly level	Do.
Barbourville	Nearly level to gent-	Sandstone and shale

TABLE 28.—*Classification of the soil series of Jackson County, Ala., by higher categories and some of the factors that have contributed to differences*[1] *in soil morphology*—Continued

AZONAL SOILS—continued

Great soil group and series	Relief	Parent material
Alluvial soils—Con.		
With gley layer:		
Melvin	do	Limestone mainly.
Atkins	do	Sandstone and some shale.
Dunning	Nearly level and slightly depressional.	Limestone mainly.
Prader	do	Sandstone and some limestone and shale.
Guthrie	Nearly level	Colluvium consisting of material derived from limestone.

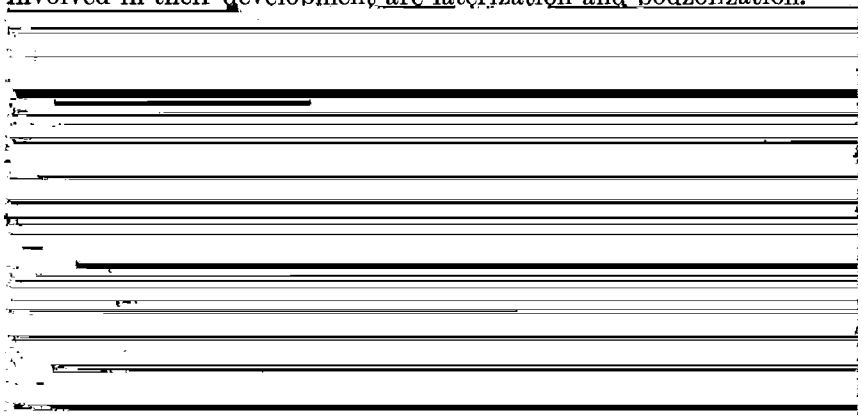
[1] Inasmuch as the factors of climate and vegetation are relatively uniform in their effect on soil throughout the county, they do not account for the broad differences in the soils.

[2] The following nine miscellaneous land types also are classified as Lithosols: Hilly stony land (Muskingum soil material), Limestone rockland (hilly), Limestone rockland (rough), Rolling stony land (Colbert soil material), Rolling stony land (Muskingum soil material), Rough gullied land (Dewey, Cumberland, and Colbert soil materials), Rough gullied land (Muskingum soil material), Rough stony land (Muskingum soil material), and Stony alluvium (Muskingum and Colbert soil materials).

RED-YELLOW PODZOLIC SOILS

RED MEMBERS

Red members of the Red-Yellow Podzolic great soil group are zonal soils that have thin organic and organic-mineral layers over a yellowish-brown leached layer, which in turn rests on an illuvial red horizon. They have developed under a deciduous or mixed forest in a warm-temperature moist climate (*13*). The soil-forming processes involved in their development are laterization and podzolization.



surface. They are distinguished by brown surface soil and reddish relatively thick permeable silty clay subsoil.

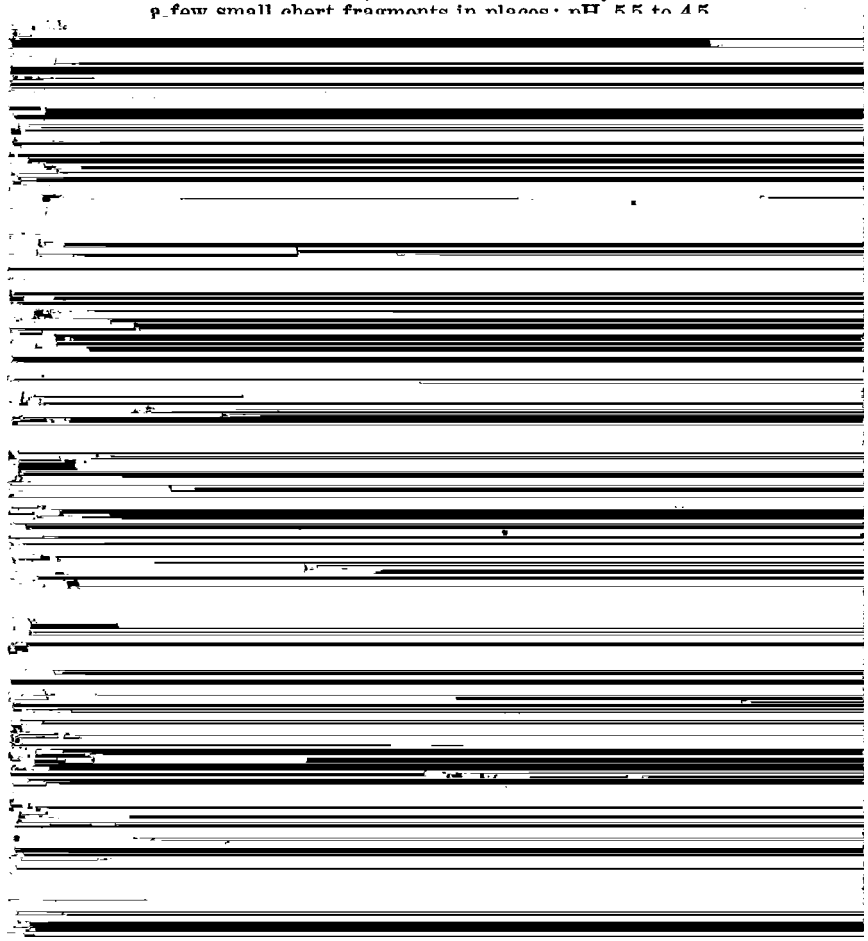
Following is a profile description of a Dewey silt loam soil:

A_2. 0 to 5 inches, dark grayish-brown to very dark-brown somewhat granular friable silt loam; a relatively large quantity of well-incorporated organic matter; material readily crushed to a mellow mass of fine rounded soft crumbs; in virgin areas a half inch or so of forest litter on the surface and a greater quantity of organic matter in the surface 2-inch A_1 layer; pH, 6.0 to 5.5.

A_3. 5 to 12 inches, dark reddish-brown somewhat granular firm but friable silt loam to silty clay loam; fairly plastic and somewhat sticky when wet; redder, firmer, coarser, and greater number of angular fragments with increasing depth; pH, 5.8 to 5.2.

B_2. 12 to 30 inches, yellowish-red or brownish-red firm but moderately friable silty clay; medium nut structure; fairly plastic when wet; numerous fine nearly black concretions and a few small chert fragments in places; pH, 5.5 to 4.5.

B_3. 30 to 48 inches, yellowish-red or brownish-red moderately stiff plastic silty clay; moderately well developed medium-sized nut structure; fragments easily crushed to fine soft particles under favorable moisture conditions; numerous fine nearly black concretions and a few small chert fragments in places; pH, 5.5 to 4.5.



A_3. 7 to 11 inches, light yellowish-brown friable cherty silt loam, somewhat finer textured and firmer than the A_2 layer; when wet slightly plastic; the quantity of chert generally increases with depth through this and the layer below.

B_2. 11 to 27 inches, reddish-yellow firm but friable cherty clay with a moderate nut structure; easily broken under favorable moisture conditions to medium-sized fragments; plastic when wet and resistant to pressure when dry; strongly to very strongly acid.

B_3. 27 to 48 inches, yellowish-red or red firm cherty clay; breaks into medium-sized angular fragments under favorable weather conditions; plastic when wet.

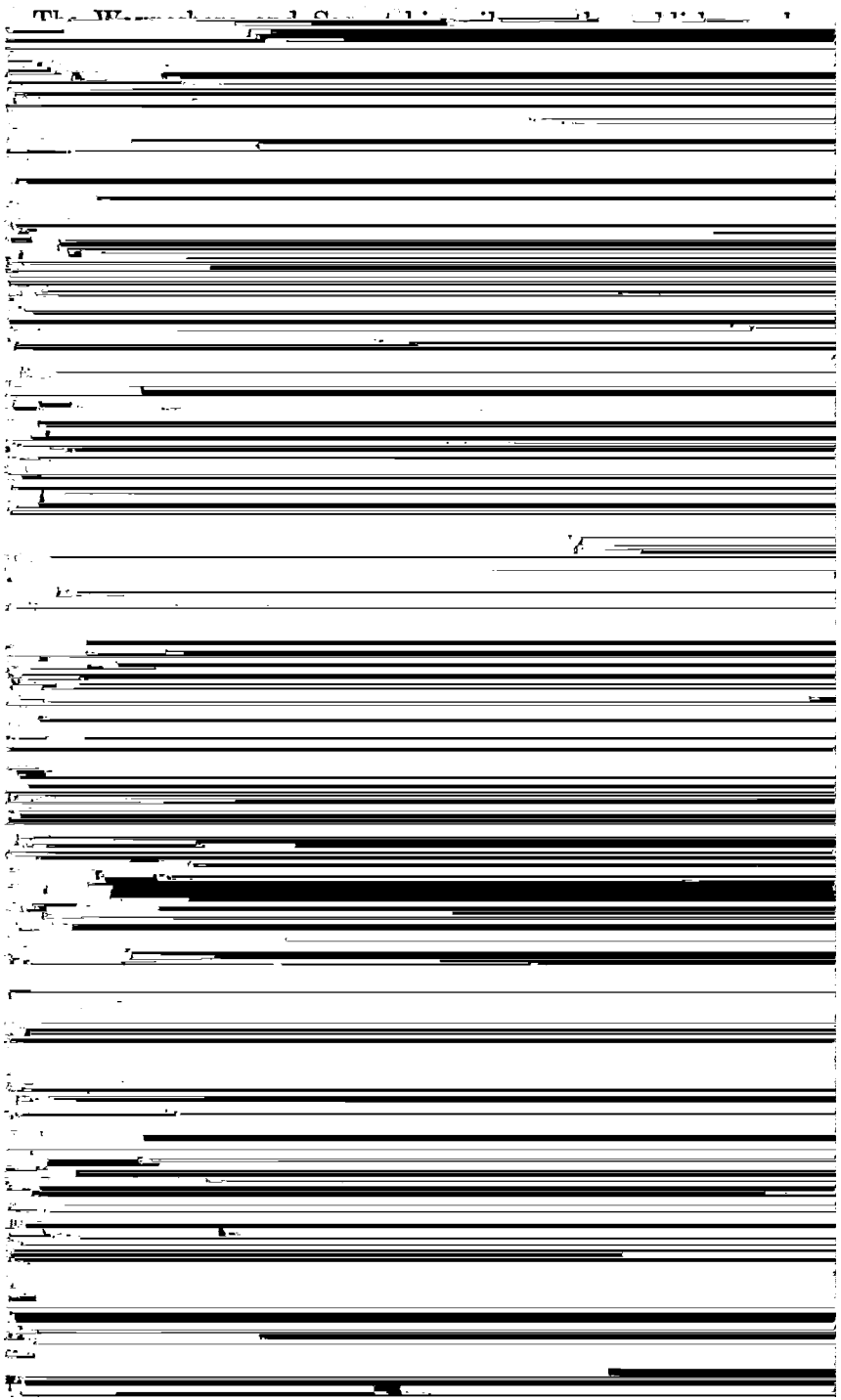
C_2. 48 inches +, red splotched with yellow and gray cherty clay; at 10 to 20 feet or more cherty limestone bedrock.

The Talbott soils have a thinner solum, a shallower depth to bedrock, a heavier more plastic consistence, and finer texture in the B and C layers than the Dewey soils. These are characteristics related to the argillaceous limestone from which the parent material is derived. The lower position, smoother relief, and shallower depth to bedrock of the Talbott soils suggest that the limestone from which they are derived weathers more rapidly and leaves a smaller quantity of residue after weathering than does the limestone from which the Dewey soils are derived. In many places the Talbott soils consist of a complex of material formed in place and accumulations of local alluvium carried from adjacent areas of stony land types. Limestone rockland, hilly

Following is a profile description of a Hanceville fine sandy loam soil that has been under cultivation for a number of years:

A_2. 0 to 8 inches, reddish-brown friable fine sandy loam; easily broken to soft crumbs; in virgin areas upper 2 inches is notably darker and contains an abundance of fine roots.

B_2. 8 to 32 inches, red to reddish-brown firm but friable fine sandy clay;



have affected them in many of the same ways that soils developed from material weathered from sandstone were affected by sandstone. The highly siliceous dolomitic limestone is weathered to great depth, and apparently in the process the residuum has lost most of its bases. The residuum is strongly acid and has a low base-exchange capacity, indicating that the siliceous part of the residuum dominates the parent material. The thickness of residuum covering the unweathered rock, however, accounts partly for the high positions of the Clarksville soils and the resultant steep slopes. In general Clarksville soils are not so susceptible to erosion as are most others developed from limestone residuum. Their lower erodibility may be partly responsible for the thickness of the weathered material over bedrock.

A description of a Clarksville cherty silt loam soil under deciduous forest is as follows:

A_1. 0 to 2 inches, gray to nearly dark-gray cherty silt loam with some roots and organic matter intermixed; little structure; medium to strongly acid.
A_2. 2 to 10 inches, light-gray to very pale-brown cherty silt loam; little structure.
A_3. 10 to 15 inches, yellow to pale-yellow cherty silt loam; little structure.
B_2. 15 to 30 inches, yellow to pale-yellow cherty silty clay loam easily broken to a weak nut structure and subsequently to a loose mass; hard when dry; very strongly acid.
B_3. 30 inches +, brownish-yellow cherty silty clay loam splotched with reddish brown and gray; in places nearly white when dry.

The entire profile is very strongly acid. The abundant chert fragments are sharply angular and range from less than 1 inch to 6 inches or more in diameter.

Soils of the Colbert series are developed over highly argillaceous limestone. In this respect they are comparable to the Talbott soils, but they differ chiefly in being yellowish rather than reddish, in having a shallower depth to bedrock, and in general a less mature profile, especially on the more sloping parts. The Colbert soils, like the Talbott, are somewhat a complex of soil material formed in place and local alluvium washed from higher lying areas of rolling stony land and limestone rockland types and other areas of Colbert and Talbott soils. The Colbert soils differ from the Clarksville chiefly in a much higher clay content, sharper gradation from the eluviated layer to the illuviated layer, and a shallower solum as well as a shallower depth to bedrock. Chert is not characteristic.

The Hartsells, Enders, and Crossville soils are developed from sandstone and/or acid shale of the sandstone plateaus under a deciduous hardwood forest. The Hartsells and Crossville are developed chiefly over sandstone, and the Enders chiefly over shale or shale and sandstone intermixed. The Hartsells have the greatest depth to bedrock, for in places the soil material is as much as 50 to 60 inches deep. The profile is mature but somewhat less so than that of the Enders soils.

A description of a Hartsells fine sandy loam soil under its native vegetation follows:

A_0. 0 to 2 inches, brownish-gray fine sandy loam; some organic matter; numerous small roots.
A_2. 2 to 9 inches, light grayish-yellow or brownish-gray fine sandy loam; weak crumb structure.
B_2. 9 to 30 inches, yellow to brownish-yellow friable fine sandy clay loam; weak nut structure; fragments range up to 1½ inches in diameter.

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C_1. 30 to 45 inches, pale-yellow fine sandy clay loam with faint gray and reddish-brown mottling; slightly firm to somewhat brittle; material easily crushed to a friable mass; lower clay content than in layer above.

C_2. 45 inches +, partly weathered sandstone fragments mixed with predominantly yellowish but variegated sandy material; bedrock at a depth of about 48 inches.

The Enders soils have a more mature zonal profile than the Hartsells and Crossville. A virgin profile of an Enders silt loam soil is as follows:

A_2. 0 to 3 inches, light-gray silt loam; weak crumb structure.

A_3. 3 to 9 inches, pale-yellow friable silt loam grading to a finer texture in the lower part; little more structure than the layer above, the mass breaking to weak subangular fragments.

B_2. 9 to 21 inches, firm but friable silty clay loam; pale yellow when dry; light yellowish brown when moist; fairly well defined nut structure; fragments to about 1 inch in diameter.

C_1. 21 to 26 inches, yellow or yellowish-brown firm silty clay; hard when dry and tough and plastic when wet; when broken forms angular fragments slightly darker on the surface than inside; in places, mottled

0 to 14 inches, light brownish-gray to light yellowish-brown mellow loam; weak crumb structure; the lower 3 or 4 inches slightly lighter colored; medium to strongly acid.

14 to 30 inches, yellowish-brown friable very fine sandy clay loam with a moderately well-developed fine nut structure.

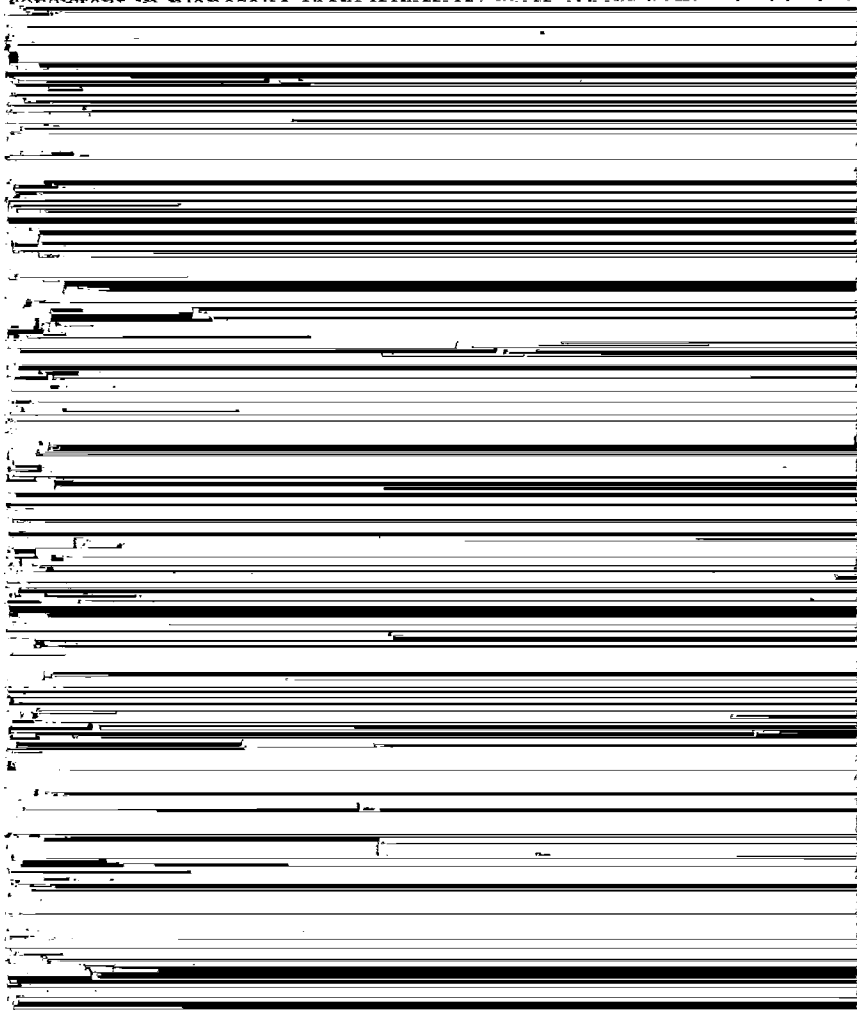
30 to 40 inches, yellowish-brown friable very fine sandy loam faintly mottled or splotched with pale-gray and brownish specks; easily broken to fine soft crumbs; strongly acid; in places underlain by irregular gravel beds but in general with no great quantity of gravel

18 to 28 inches, olive sticky plastic clay; breaks to nutlike fragments ⅜ to ⅝ inch in diameter; olive-gray mottlings; slightly acid to neutral.
28 to 37 inches, pale-olive clay; breaks to angular fragments; very hard when dry, very plastic when wet; neutral to mildly alkaline.

PLANOSOLS

Planosols are a group of intrazonal soils that have eluviated surface horizons, underlain by B horizons more strongly illuviated, cemented, or compacted than those of associated normal soils. They have developed on nearly level uplands under grass or forest vegetation in a humid or subhumid climate (*13*).

The soil series in this county designated as Planosols are the Wolftever, Tupelo, Taft, Robertsville, Monongahela, and Tyler. Few of them, however, are properly in this great soil group according to the definition. The Robertsville and Tyler soils are probably the most

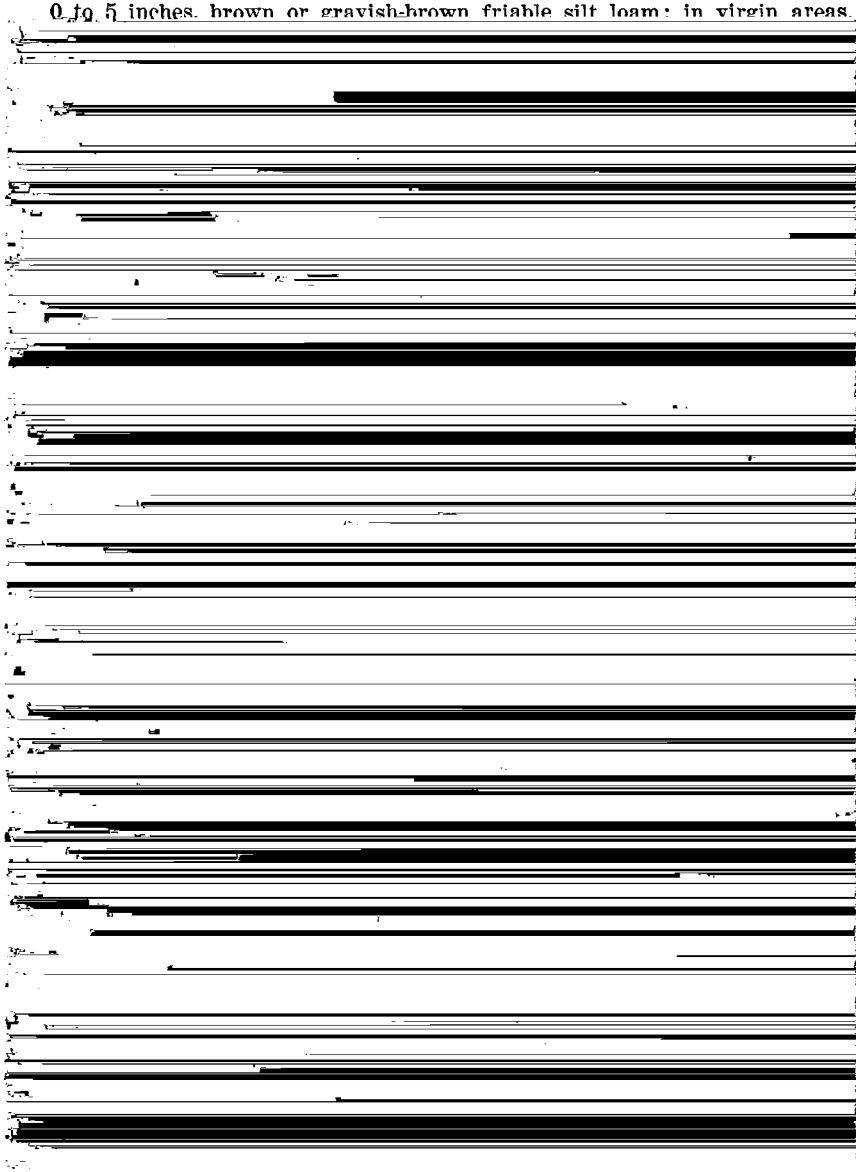


and illuviated layers so striking. The soil below the eluviated layer is commonly dark-mottled concretionary material.

The Wolftever soils are associated with and in some respects are related morphologically to the soils of the Huntington-Egam-Lindside-Melvin catena. All of these soils have the same parent material, the Wolftever differing chiefly in being older and therefore having at least a moderately developed profile.

A Wolftever silt loam soil in a cultivated field has the following profile:

0 to 5 inches, brown or grayish-brown friable silt loam; in virgin areas



28 to 42 inches, pale-gray firm silty clay mottled with yellowish brown and reddish brown; compact and plastic, although in some places to a lesser degree than in the layer above.

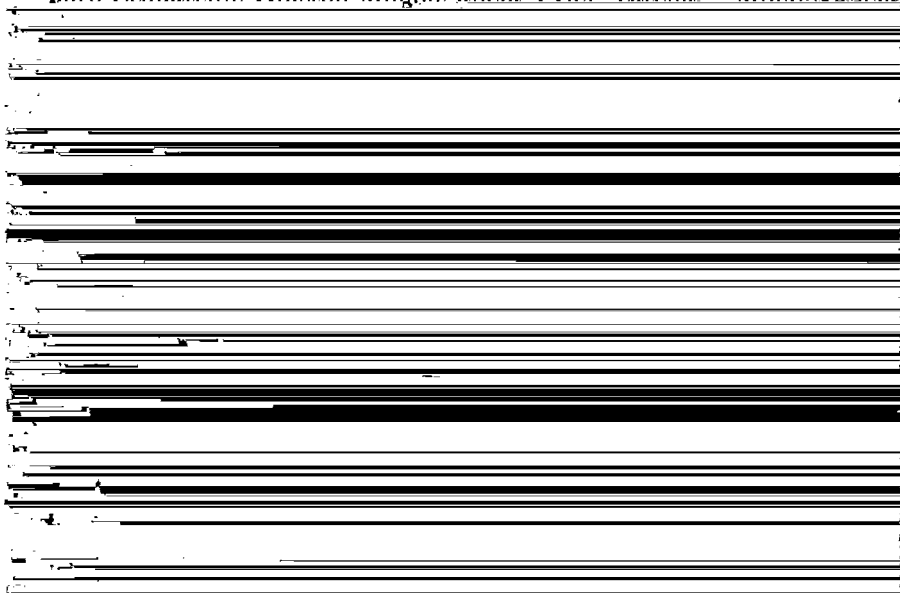
The entire profile is strongly to very strongly acid. Slight variations in drainage are strongly reflected in the color of the solum, the better drained part being more yellow and less mottled.

The Robertsville series is the poorest drained member of the Cumberland-Etowah-Capshaw-Taft-Robertsville catena. The Robertsville soil occupies the lowest parts or slight depressions on the stream terraces. Internal drainage is very slow, and as a result the solum is very wet or waterlogged for many months during the cooler part of the year and very dry during the driest hottest season. Such conditions have been unfavorable for the accumulation of organic matter, as the eluviated layer of the soil is very light gray or nearly white except for light accumulation in the upper inch or so of the solum. The profile is characterized by a very light-colored floury silt loam A horizon and a very compact clayey or mottled B horizon.

The profile of Robertsville silt loam in a cultivated area is as follows:

1. 0 to 6 inches, nearly white or very pale-gray floury silt loam; in virgin areas the upper half inch is dark-gray silt loam.
2. 6 to 10 inches, light yellowish-gray friable silt loam; a few dark-brown concretions; lower part of the layer generally faintly mottled and somewhat finer textured.
3. 10 to 30 inches, mottled pale yellowish-gray and brownish-yellow silty clay; where the profile is more strongly developed, very compact and plastic; in the few places where the profile is less strikingly developed, very firm but somewhat crumbly in consistence and structure; tendency everywhere to break under pressure into angular fragments.
4. 30 to 48 inches, pale-gray mottled with light reddish-brown plastic silty clay.

The Monongahela series is the poorly drained member of the Waynesboro-Sequatchie-Holston-Monongahela-Tyler catena. Monongahela



LITHOSOLS

Lithosols include miscellaneous intrazonal and azonal soils that vary greatly in character and degree of soil development, in nature and depth of soil and soil material, and in external features, as relief,

A profile of a Muskingum fine sandy loam soil is as follows:

0 to 4 inches, grayish-brown or brownish-gray fine sandy loam; weak crumb structure; upper inch is more notably dark because of an abundance of fine roots and partly disintegrated organic matter.

4 to 12 inches, yellowish-gray or grayish-yellow friable material ranging in texture from fine sandy loam to fine sandy clay loam; weak nut structure.

12 to 16 inches, splotched or variegated yellowish-brown or gravish-yellow

slightly higher. The two soils are derived from similar material, but the Egam soil is characterized by a layer, at a depth of 12 inches, that is finer textured and more compact than the corresponding layer in the Huntington soil. The Egam soil may be older morphologically than the Huntington or it may have formed because of particular periods in which coarse and fine materials were deposited. It is not known which of these factors cause differences between the two series. In many places the compact layer in Egam soil is dark and suggests an old surface layer that has been buried under more recent alluvium.

The upper 12 inches in Egam soil is generally grayish-brown to dark grayish-brown mellow silt loam grading with depth to silty clay loam. Underlying is a layer of dark grayish-brown to nearly black moderately compact silty clay 12 to 20 inches thick. This underlying material is generally less fine in texture and less compact than the material above and is mottled with gray, yellow, and brown. The mottling increases with depth. The soil is medium to slightly acid throughout. Because Egam soil is subject to flooding and often receives new deposits of alluvial material, it appears that the heavy layer is not entirely the result of illuviation from layers above.

Soils of the Dunning, Guthrie, Melvin, Prader, and Atkins series have been classified as Alluvial soils with a gley layer.

Soils of the Dunning series consists of fine-textured alluvium washed mainly from soils underlain by limestone. Like the Melvin soils it is a young very poorly drained soil on first bottoms, slightly acid to slightly alkaline in reaction, and with a gleylike subsoil. It differs from the Melvin soils in that it is notably darker colored to a depth of 8 to 20 inches.

In several respects soil of the Dunning series qualifies as a member of the Half Bog great soil group, which is an intrazonal group of

are notably more sandy and pervious than the Sturkie and Prader soils, and much of their aggregate area is on swells or natural levees of the first bottoms.

Bruno fine sandy loam typically has the following profile:

0 to 8 inches, pale-brown to brown loose friable fine sandy loam.
8 to 20 inches, brown to yellowish-brown fine sandy loam; contains a little more clay than the layer above; weak nut structure in places.
20 to 36 inches, yellowish-brown friable fine sandy loam, a little lighter colored than the layer above and coarser in texture with depth; the texture at a depth of 40 inches is commonly loamy fine sand but in some places sandy loam.

The [illegible]

faintly mottled with gray, the gray increasing with depth. The entire profile is strongly to very strongly acid.

The Philo series has slower internal drainage than does the Pope and in this respect corresponds with the Lindside and Sturkie series. Philo soil is consistently lighter brown throughout the upper 15 or 18 inches than is the Lindside in the corresponding part. In this respect Philo soil shows less contrast with the Sturkie profile. The entire Philo profile is strongly to very strongly acid.

The Atkins series is the most slowly drained member of the Pope-Philo-Atkins catena. In this respect Atkins soil is like those of the Melvin and Prader series, and it is classified as an Alluvial soil with a gley layer. Its profile is predominantly gray and in the lower part relatively tight and plastic. The texture of the entire profile generally is finer than that of the other members of the catena. Like the Melvin and Prader soils it occupies the lowest parts of the bottom lands on which it occurs and is the most subject to overflow of the members of its catena. The separate areas of both the Philo and Atkins soils in the county are small and interassociated, and therefore they were mapped as a complex rather than separately.

A typical Atkins silt loam profile is as follows:

0 to 2 inches, dark-gray to very dark-gray silt loam containing a notable quantity of organic matter.
2 to 6 inches, light-gray moderately friable but sticky silty clay loam; brown, yellow, and bluish-gray fine mottlings.
6 to 24 inches +, gray, or bluish-gray mottled with brown and yellow, plastic silty clay.

The entire profile is very strongly acid. The texture of Atkins soil varies relatively widely; in places the surface layer is fine sandy loam and the subsoil has a notably higher content of sand than indicated in the profile description.

The Barbourville series is the better drained member of the Barbourville-Cotaco catena. The profile of Barbourville soil resembles that of the Pope, being predominantly light brown and free of mottlings to a depth of 20 or 30 inches. Below this the soil is mottled gray, yellow, and brown friable clay loam. The Cotaco series corresponds to the Philo series, the material below a depth of 10 or 12 inches being mottled. The soils of both of these series are strongly to very strongly acid throughout their entire depth. Barbourville and Cotaco soils occur in such small interassociated areas that they were mapped as a complex rather than separately.

LABORATORY DETERMINATIONS

Mechanical analyses of several soils are given in table 29. The Crossville, Hanceville, Hartsells, and Enders soils listed in this table are from the sandstone plateaus; the Clarksville, Dewey, and Wolftever are from the limestone valleys. The soils on sandstone plateaus are those developed from (1) sandstone with conglomerate

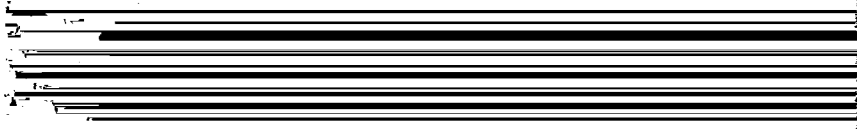


TABLE 29.—*Mechanical analyses of several soils in Jackson County, Ala.*

Soil and sample No.	Depth	Material and diameter of particles (in millimeters)						
		Very coarse sand (2.0–1.0)	Coarse sand (1.0–0.5)	Medium sand (0.50–0.25)	Fine sand (0.25–0.10)	Very fine sand (0.10–0.05)	Silt (0.005–0.002)	Clay (0.002–0)
	Inches	*Percent*	*Percent*	*Percent*	*Percent*	*Percent*	*Percent*	*Percent*
Crossville loam:								
418401	0–7	0.3	4.2	17.6	14.8	2.1	40.9	20.1
418402	7–15	.1	3.9	14.7	11.1	1.6	37.7	30.9
418403	15–22	.7	4.2	16.9	13.3	1.8	35.2	27.9
408404	22–30	.9	5.1	21.2	19.0	2.7	28.5	22.6
Clarksville cherty silt loam, rolling phase:								
418405	0–2	16.4	9.1	4.6	6.7	3.6	45.0	14.6
418406	2–10	5.4	7.3	4.4	6.2	3.5	54.8	18.4
418407	10–24	6.5	7.2	4.5	6.7	4.6	52.7	17.8
418408	24–40	7.9	8.1	5.2	7.8	6.4	45.8	18.8
Hartsells fine sandy loam, undulating phase:								
418409	0–2	1.4	11.7	14.8	24.5	5.4	35.1	7.1
418410	2–6	1.4	11.9	15.7	22.9	4.2	35.4	8.5
418411	6–16	1.1	11.3	14.7	23.4	4.1	35.8	9.6
418412	16–24	1.1	11.2	14.2	22.2	4.2	35.5	11.6
418413	24–38	1.5	12.3	16.8	27.8	5.2	27.2	9.2
Hanceville fine sandy loam, undulating phase:								
418426	0–3	.5	8.2	20.4	25.3	7.4	20.3	17.9
418427	3–8	.4	9.0	19.7	22.5	6.2	19.5	22.7
418428	8–12	.8	7.3	15.2	17.9	4.4	24.6	29.8
418429	12–18	.5	7.8	17.3	20.1	5.3	11.7	37.3
418430	18–24	.8	8.0	16.2	17.7	4.1	16.6	36.6
418431	24–32	1.0	9.2	17.3	17.9	4.1	16.4	34.1
418432	32–40	1.1	8.9	16.5	18.4	4.6	16.4	34.1
418433	40–50	1.6	9.3	16.6	18.7	4.9	16.8	32.1
418434	50–62	1.7	11.6	18.9	19.6	5.0	17.4	25.8
418435	62–75	2.7	10.6	16.8	16.1	4.6	13.7	35.5
Enders silt loam, undulating phase:								
418437	0–½	.6	.6	1.1	6.3	30.1	53.8	7.5
418438	½–3	.2	.5	.9	5.3	28.8	54.9	9.4
418439	3–9	.3	.4	.8	4.8	24.8	53.8	15.1
418440	9–13	.5	.4	.9	4.3	24.3	52.2	17.4
418441	13–16	.5	.4	.7	4.1	22.1	51.3	20.9
418442	16–21	0	.2	.4	2.8	15.6	50.9	30.1
418443	21–26	0	.1	.1	.8	6.4	53.3	39.3
418444	26–33	0	.1	.2	.5	11.0	53.9	34.3
418445	33–41	0	0	.1	.8	15.1	51.0	33.0
418446	41–46	0	.1	.4	12.4	51.2	27.5	8.4
Dewey silt loam, undulating phase:								
4184121	0–3	2.0	7.5	5.0	10.7	7.0	50.5	17.3
4184122	3–6	1.2	5.6	3.4	6.9	6.0	56.5	20.4
4184123	6–16	.9	3.9	2.3	4.9	4.5	55.5	28.0
4184124	16–26	1.2	4.3	2.2	4.6	4.3	52.0	31.4
4184125	26–36	1.8	3.9	1.9	3.4	4.3	45.1	39.6
4184126	36–46	1.5	3.5	1.9	4.1	4.5	41.1	43.4
4184127	46–54	1.1	3.4	1.9	4.2	4.6	39.0	45.8
Wolftever silt loam, level phase:								
4184207	0–6	.4	1.1	4.9	16.4	6.3	46.5	24.4
4184208	6–10	.3	1.3	4.7	13.9	5.5	44.3	30.0
4184209	10–18	.4	1.3	5.0	14.1	5.2	39.5	34.5
4184210	18–26	.9	1.5	6.3	17.8	6.1	37.3	30.1
4184211	26–34	.9	2.0	8.1	23.5	7.6	33.5	24.4
4184212	34–42	1.1	2.6	9.8	26.4	8.1	28.4	23.6

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