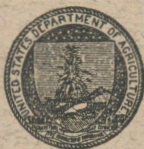


UNITED STATES DEPARTMENT OF AGRICULTURE
BUREAU OF CHEMISTRY AND SOILS
In cooperation with the Mississippi Geological Survey

SOIL SURVEY
OF
CLAIBORNE COUNTY, MISSISSIPPI

BY
B. H. HENDRICKSON, in Charge, and J. E. McKEEHEN

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SOIL SURVEY OF CLAIBORNE COUNTY, MISS.

By B. H. HENDRICKSON, in Charge, and J. E. McKEEHEN

COUNTY SURVEYED

Claiborne County is in southwestern Mississippi. Mississippi River and Big Black River form the western and northern boundaries. From the northernmost to the southernmost point along the eastern boundary is about 30 miles. The greatest east-west dimension, near the southern boundary, is 31 miles. The land area of the county is 477 square miles, or 305,280 acres.

Physiographically the region of which Claiborne County is a part consists of a smooth low plain immaturesly dissected by streams. The major stream is Mississippi River, whose valley or alluvial flood plain is very broad, including within it many areas as large as Claiborne County. The boundaries of Claiborne County lie in such a position that a narrow border along the northwestern side of the county lies wholly within the low Mississippi alluvial plain. The rest of the county lies within the coastal-plain upland, which is dissected immaturesly as a whole but varies locally from fully matured to very immature in dissection. A belt in the western part of the county lying parallel to the northwestern boundary line and ranging in width from a mile or 2 to 4 or 5 miles, together with broad or narrow belts extending eastward across the county along both sides of the streams, is maturely dissected and rough. The rest of the area of the county is smooth, consisting of the coastal-plain upland slightly or locally not at all modified by dissection.

The maturely dissected belt in the western part of the county is known as the "cane hills" or the "bluff region." It constitutes one-half the upland area of the county. In topographic conformation it may be described as a region of extremely deep and intricate dissection, with numerous streams and streamlets terminating in abrupt declivities where the loessial material stands vertical or nearly vertical.

Elevations above sea level within the county range from about 80 or 90 feet on the Mississippi flood plain to a maximum of about 275 feet on the uplands.

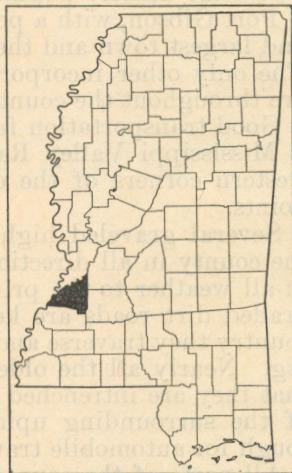


FIGURE 1.—Sketch map showing location of Claiborne County, Miss.

The drainage of the county is received by Mississippi River. A very well-established system of intricate dendritic pattern has developed, so that practically all parts of the county are reached by natural drainage ways. The channels of the larger streams are well intrenched and the banks stand from 10 to 20 feet above low-water level. Ordinary rains do not cause inundation of the cultivable lands of the Big Black River or Bayou Pierre bottoms or of the bottoms of other larger creeks.

Claiborne County was organized in 1802 and is the second oldest county in Mississippi. The early settlers were of Anglo-American stock and came largely from States to the eastward, as far north as Virginia. The census of 1920 gives the population of the county as 13,019, all classed as rural, of which 73.7 per cent is colored and 26.3 per cent white. The population to the square mile is 26.6. Settlement is thinly distributed in the Mississippi bottom lands and in the bluff region of the uplands but is well distributed elsewhere. The most densely populated region is the vicinity of Port Gibson.

Port Gibson, with a population of 1,691 in 1920, is the county seat and largest town and the principal shipping and distributing point. The only other incorporated town is Hermanville. Smaller towns are throughout the county.

Good transportation facilities are furnished by lines of the Yazoo & Mississippi Valley Railroad. Only the northeastern and southwestern corners of the county are distant from railroad shipping points.

Several graveled highways lead out from Port Gibson through the county in all directions, except westward, providing good roads in all weather to the principal towns and farming districts. Many graded dirt roads are kept in fair condition, in spite of the hilly country they traverse and their susceptibility to washouts and gully-ing. Nearly all the older roads have been cut down by erosion so that they are intrenched from 8 to 20 feet in places below the level of the surrounding upland. Secondary roads are apt to be too rough for automobile travel.

All parts of the county are served by rural mail routes, but telephones in the rural districts are found principally on the larger plantations. Churches and schools are located at intervals throughout the county, and a college and academy are at Port Gibson. The Alcorn Agricultural and Mechanical College, a State institution for negroes, is in the southwestern part of the county.

Port Gibson is the principal local market for cotton, vegetables, and poultry and dairy products. The principal markets for cattle and hogs are St. Louis, Vicksburg, and New Orleans.

CLIMATE

Claiborne County has a warm temperate humid climate characterized by long summers during extended periods of which the day temperatures range between 90° and 100° F.; short mild winters, with intermittent cold periods of a few days' duration; and pleasant spring and fall weather. Though the continued heat of summer is rather depressing it is not unhealthful. The short winters are

usually characterized by much damp cloudy weather and extended rainy periods. Freezing weather has occurred at times from November to February, inclusive, but cold periods rarely last more than a few days, so that the ground seldom freezes. There is little hindrance to winter field work, aside from delay caused by rainy weather.

The mean annual precipitation is 53.38 inches. During the summer months the rainfall is often in the form of local rains or thunderstorms which sometimes are torrential. In winter, general rains are more common. At rare intervals, commonest in spring and early summer, very heavy downpours have occurred, sending streams out of banks and causing considerable damage to roads, bridges, and bottom-land crops. The humidity is relatively high. More rain ordinarily falls during winter and spring than in summer and fall. The rainfall, however, is fairly well distributed throughout the year. Short summer droughts are common but ordinarily do not cause farmers as much concern as do excessive rains. The average annual snowfall is only 1.1 inch. Hail and sleet are rare.

The average frost-free season for tender vegetation is 223 days, the average date of the last killing frost being March 22 and of the first November 1. The latest frost on record occurred on April 11 and the first on October 15. These frost dates were obtained at Port Gibson, which is located in the valley of Little Bayou Pierre in a situation favorable to frost. It is to be noted that the average frost-free season at Vicksburg, 35 miles farther north, and at Jackson, about 50 miles northeast, is 256 days. These figures are considered to be more representative of actual growing-season conditions for the uplands of this county. The bottom lands immediately adjacent to Mississippi River also have a somewhat longer growing season than the inland valleys, on account of the tempering effect of the water.

Table 1, compiled from records of the United States Weather Bureau station at Port Gibson, gives the normal monthly, seasonal, and annual temperature and precipitation for Claiborne County.

TABLE 1.—*Normal monthly, seasonal, and annual temperature and precipitation at Port Gibson, Miss.*

[Elevation, 116 feet]

| Month | Temperature | | | Precipitation | | | |
|---------------|-------------|------------------|------------------|---------------|---|--|---------------------|
| | Mean | Absolute maximum | Absolute minimum | Mean | Total amount for the driest year (1924) | Total amount for the wettest year (1923) | Snow, average depth |
| | ° F. | ° F. | ° F. | Inches | Inches | Inches | Inches |
| December..... | 48.5 | 80 | 10 | 5.86 | 5.50 | 11.70 | 0.2 |
| January..... | 48.1 | 82 | 0 | 5.12 | 6.32 | 5.45 | .6 |
| February..... | 49.6 | 85 | -3 | 5.13 | 3.00 | 8.28 | .3 |
| Winter..... | 48.7 | 85 | -3 | 16.11 | 14.82 | 25.43 | 1.1 |
| March..... | 58.6 | 92 | 20 | 5.47 | 4.39 | 11.76 | (¹) |
| April..... | 64.9 | 92 | 30 | 5.36 | 4.83 | 8.75 | .0 |
| May..... | 71.7 | 99 | 35 | 4.03 | 5.56 | 7.63 | .0 |
| Spring..... | 65.1 | 99 | 20 | 14.86 | 14.78 | 28.14 | (¹) |

¹ Trace.

TABLE 1.—*Normal monthly, seasonal, and annual temperature and precipitation at Port Gibson, Miss.—Continued*

[Elevation, 116 feet]

| Month | Temperature | | | Precipitation | | | |
|----------------|-------------|------------------|------------------|---------------|---|--|---------------------|
| | Mean | Absolute maximum | Absolute minimum | Mean | Total amount for the driest year (1924) | Total amount for the wettest year (1923) | Snow, average depth |
| | ° F. | ° F. | ° F. | Inches | Inches | Inches | Inches |
| June..... | 78.6 | 103 | 47 | 4.81 | 2.29 | 5.48 | .0 |
| July..... | 80.8 | 103 | 54 | 4.83 | .75 | 8.23 | .0 |
| August..... | 80.5 | 107 | 54 | 3.93 | 1.63 | 3.21 | .0 |
| Summer..... | 80.0 | 107 | 47 | 13.57 | 4.67 | 16.92 | .0 |
| September..... | 75.9 | 101 | 37 | 2.94 | .51 | 1.80 | .0 |
| October..... | 64.5 | 96 | 24 | 2.40 | .17 | 1.36 | .0 |
| November..... | 55.4 | 87 | 16 | 3.50 | .14 | 4.50 | (1) |
| Fall..... | 65.3 | 101 | 16 | 8.84 | .82 | 7.66 | (1) |
| Year..... | 64.8 | 107 | -3 | 53.38 | 35.09 | 78.15 | 1.1 |

¹ Trace.

AGRICULTURE

The first settlement in what is now Claiborne County was made at Port Gibson in 1783. The site selected was on the banks of Little Bayou Pierre, 2 miles above its junction with Bayou Pierre, a stream sufficiently large to be navigated by small trading vessels entering from Mississippi River. The distance from Port Gibson by water to Mississippi River is about 16 miles.

By 1833 another settlement, called Grand Gulf, had grown up on the banks of the Mississippi. Trading competition became so keen that a small railroad was built from Port Gibson to Grand Gulf Landing to facilitate freight shipment to the former town. After this Grand Gulf declined. Port Gibson became an important shipping and trading center at the time of the Civil War. It had then about twice its present population.

Though the Civil War severely affected Claiborne County, the loss suffered here was less serious than elsewhere in the South. The principal effect was the disorganization of agriculture and industry resulting from the sudden freeing of the slaves. Previous to the war cotton, corn, field peas, oats, and sweetpotatoes were the principal crops, and some wheat was grown. Some cattle and hogs were raised. Cotton was the main cash crop and corn the principal subsistence crop, as they are to-day. Cotton growing was very profitable on account of the prevailing high prices for the lint, and the tendency was to neglect everything else for that crop. The cotton credit system, by which a planter could borrow money and obtain credit before the seed was sown, was put into effect. Many of the planters mortgaged their crop in advance to the middlemen, and debts increased. Under these conditions meat, corn, hay, and many vegetables were shipped in. The introduction of Bermuda grass and

Lespedeza (Japan clover) between 1875 and 1885 caused pasture lands to improve.

Previous to the war large land holdings were common, even in the rough cane-hill section, and the percentage of land cleared and planted was much larger than at present. The sharp ridges and steep slopes prevalent in parts of the county, and now recognized as too rugged for cultivation, were then largely planted to cotton. A number of prosperous cotton plantations were located on the terraces and bottoms of Bayou Pierre and other streams and on the rolling uplands. The more desirable Mississippi bottom lands were brought under cultivation, and large cotton yields were obtained. Some of the best of the river plantation lands have since been swept away by the shifting channel of Mississippi River. Also, the higher level reached by flood waters since the construction of the high Louisiana levees has made farming on the east side of the river much more hazardous in recent years. At present only negro tenant farmers live on the remaining cultivable land in the Mississippi bottoms, and they find it necessary to seek refuge in the hills during high flood stage of the river. A number of large plantations remain in the western part of the county, but in the eastern part the original large holdings have to a much greater extent been broken up and sold in smaller parcels.

Over a large part of the county the type of agriculture is in general the same as it was before the war. Cotton is the principal cash crop and the main basis of credit, and corn is the main subsistence crop. Farm labor is largely supplied by negroes, most of whom are tenants. The advent of the boll weevil in 1908 was a serious blow to cotton production, and its ravages since have exacted an enormous toll of the cotton crop, resulting in abandonment of a large total acreage and the exodus of at least two-fifths of the farming population. A favorable season and good cotton crop in 1925 are said to have stopped movement of negro laborers out of the county, and the population is said to be again on the increase. When the seriousness of the boll-weevil invasion was realized by the planters, diversification of crops began.

Table 2 gives the acreage and production of the principal crops in Claiborne County in census years from 1879 to 1924, inclusive:

TABLE 2.—*Acreage and yield of principal crops in census years*

| Crop | 1879 | | 1889 | | 1899 | | 1909 | | 1919 | | 1924 | |
|--------------------|-------------------------|---------------------------|-------------------------|-------------------------------|-------------------------|------------------------------|-------------------------|-------------------------------|-------------------------|-------------------------------|-------------------------|-----------------------------|
| Cotton..... | <i>Acres</i> 33, 121 | <i>Bales</i> 18, 518 | <i>Acres</i> 35, 218 | <i>Bales</i> 17, 347 | <i>Acres</i> 43, 272 | <i>Bales</i> 18, 690 | <i>Acres</i> 36, 596 | <i>Bales</i> 8, 744 | <i>Acres</i> 22, 201 | <i>Bales</i> 4, 052 | <i>Acres</i> 15, 540 | <i>Bales</i> 5, 963 |
| Corn..... | <i>Bush.</i> 15, 744 | | <i>Bush.</i> 13, 459 | | <i>Bush.</i> 28, 323 | | <i>Bush.</i> 25, 986 | | <i>Bush.</i> 24, 221 | | <i>Bush.</i> 19, 013 | |
| Oats..... | 82 | 1, 290 | 53 | 540 | 79 | 1, 700 | 77 | 1, 085 | 1, 277 | 20, 546 | 761 | 19, 310 |
| Sweetpotatoes..... | 457 | 49, 281 | 216 | 17, 925 | 224 | 16, 795 | 695 | 54, 433 | 597 | 60, 377 | 184 | 10, 298 |
| Potatoes..... | | 4, 951 | 31 | 2, 200 | 33 | 2, 101 | 110 | 8, 216 | 87 | 5, 620 | 23 | 948 |
| Hay..... | 68 | <i>Tons</i> 72 | 87 | <i>Tons</i> 114 | 1 499 | <i>Tons</i> 756 | 1 2, 139 | <i>Tons</i> 2, 997 | 1 6, 207 | <i>Tons</i> 9, 387 | 3, 392 | <i>Tons</i> 3, 304 |
| Sugarcane..... | 8 | <i>Gals. sirup</i> 594 | 81 | <i>Gals. sirup</i> 10, 052 | 155 | <i>Gals. sirup</i> 3, 769 | 345 | <i>Gals. sirup</i> 38, 015 | 178 | <i>Gals. sirup</i> 18, 556 | 3 | <i>Gals. sirup</i> ----- |
| Tobacco..... | 3 | <i>Lbs.</i> 1, 010 | ----- | <i>Lbs.</i> ----- | ----- | <i>Lbs.</i> ----- | ----- | <i>Lbs.</i> ----- | ----- | <i>Lbs.</i> ----- | ----- | <i>Lbs.</i> ----- |

¹ Hay and forage.

The use of improved early-maturing varieties of cotton, early planting, the use of fertilizers designed to hasten maturity, and dusting with calcium-arsenate powder to poison the weevils are measures taken to keep production of this crop profitable. Both long and short staple varieties are grown, but the short staple predominates. Long-staple varieties, which are grown principally in the western part of the county, are the Delfos, Webber, and Allen Hybrid. The short-staple cotton produced is largely of the Wannamaker, Cleveland, Simpkins, and Cleveland Big Boll varieties.

Hastings Prolific and local varieties of corn are grown. This crop is used as grain and forage for work animals and for fattening hogs and cattle. Practically none is sold outside the county, and often some is shipped in.

Hay, consisting largely of tame or cultivated grasses and clovers, together with some grain cut green, legumes cut for hay, and silage crops, is the crop third in importance. There are very few silos in the county. The hay produced is used as feed for work animals and beef and dairy cattle.

Oats are becoming an important winter pasture and feed crop. Red Rustproof (Red Texas) and other rust-resistant varieties are grown. Cowpeas are grown to a considerable extent. Some of the crop is interplanted with corn, the seed usually being picked at maturity and the vines pastured by hogs and cattle or made into pea-vine hay.

Sweetpotatoes and potatoes are grown in a small way on nearly every farm for home use and local sale and sugarcane and sorgho (sweet sorghum) for sirup for home and local use.

Tomatoes for the early spring market are grown to some extent in the northeastern part of the county. It is estimated that about 200 acres were grown in 1926, mostly in fields from 1 to 3 acres in extent.

The cultivation of fruits has never received much attention in Claiborne County, and there are no commercial orchards. Fruits grown in small home orchards are mostly peaches and nectarines. Pecan culture is becoming somewhat more important each year, and there are a few small orchards of improved budded trees. Soybeans, velvetbeans, and peanuts are grown to a small extent. Most farmers maintain a spring and fall vegetable garden to supply home needs. Wild dewberries, blackberries, and plums are very common, and persimmon trees are occasionally seen.

Pastures in this county are much better and more easily maintained than in most places in the South. Bermuda grass and Lespedeza grow everywhere in open places and furnish excellent pasturage for eight months of the year. Wild switch cane, in the cane hill section, is of some value as winter pasturage. It is said to be gradually dying out. Bur clover, white clover, vetch, and red clover are found in upland pastures to some extent, and Johnson grass grows in many bottom-land areas. Johnson grass is sometimes cut for hay, as is also red clover and Lespedeza.

About two-thirds of Claiborne County is forested, the tree growth consisting of mixed hardwoods and loblolly pine. The pine is more common in the eastern part of the county, but is also found everywhere on the uncultivated uplands and terraces, except in poorly drained places. The hardwoods include gum, sycamore, poplar, mag-

nia, beech, linden, elm, boxelder, holly, honeylocust, cottonwood, white, red, pin, overcup, and water oaks, ash, hickory, and dogwood.

Lumbering began to assume importance about the beginning of the present century and received a stimulus during the World War. The county is known to produce high-quality hardwood lumber, large quantities of which have been cut and shipped by rail or made into rafts and towed on Mississippi River to Natchez or Vicksburg lumber mills. The most important merchantable hardwoods are ash, oak, magnolia, poplar, and gum. About 15 small sawmills are operating in the county at the present time. A box-material mill in operation at Port Gibson is shipping about 10,000 board-feet a day of rotary-cut lumber which is used in the manufacture of crates and wire-bound boxes. Many kinds of trees are used for this purpose, including gum, sycamore, poplar, beech, and cottonwood. At a stave mill at Port Gibson oak is utilized in the manufacture of barrel staves. Blocks of dogwood are shaped at a small mill for shuttles for cotton-mill machines.

A rather large part of the county is too rough and broken for agriculture, and the utilization of such tracts for commercial forests is both desirable and profitable. Better methods of forest management are coming into use; forest fires are generally guarded against, and the more rapid growth of merchantable trees is encouraged. The production of timber will doubtless continue to be important in the county.

On the steep slopes and numerous ravines of the bluff region are yellow poplar, magnolia, honeylocust, ash, hickory, gum, mulberry, linden, elm, red, white, post, and other oaks, walnut, maple, and beech trees. The shrubbery is chinquapin, witch-hazel, flowering dogwood, crab apple, ironwood, spicewood, papaw, red maple, and redbud. Loblolly pine is generally intermixed with the hardwoods but is lacking in some areas. Spanish moss is very characteristic of this region and is found hanging in long festoons from the branches of the hardwood trees. Creeping vines, some of great size, are common. Among them are numerous wild grapevines, Virginia creeper, poison ivy, and crossvine. Cherokee rosebushes are found in profusion in open fields and pastures.

The only cultivable land in the Mississippi bottoms is the few cleared areas of better-drained alluvium constituting the Sarpy soils. The remainder of the Mississippi bottoms and nearly all the bottom land of Big Black River are heavily forested with willow, cottonwood, overcup oak, water oak, gum, sycamore, elm, and some cypress.

There are areas of woodland on nearly every farm, the timber occupying the rougher land, steep slopes, and poorly drained areas. Around the old plantation sites are hackberry, cedar, and chinaberry trees. In places there are clumps of yucca, or Spanish bayonet.

Much of the farm land abandoned for cultivation since the advent of the boll weevil is reverting to forest by natural reseeding. In these old fields, broom sedge, grass, and weeds usually give way to sumac, honeylocust, and sassafras, and saplings of forest trees. As a rule the hardwoods take the ascendancy over pine in natural reforestation if mixed woods are adjacent to the fields. The seeds of the loblolly or old-field pine are light in weight and produced in large quantities. They distribute well if a few seed-bearing trees

are allowed to stand near old fields and eroded areas to be reforested. In the eastern part of the county there are many badly eroded hilly and gullied fields which can be best utilized for timber growing.

Census figures relating to domestic animals are not available previous to the census of 1910. In 1910 there were in the county 2,602 head of cattle and 6,638 swine, 372 sheep and goats were sold or slaughtered, and 154 horses and mules were sold. The total value of these animals was \$102,715. The value of dairy products, excluding those used at home, was \$48,739; of poultry and eggs, \$56,712; and of wool and mohair, \$501. The total value of livestock and livestock products was \$208,667.

According to the census of 1920 there were in the county 3,734 horses, 2,279 mules, 20,408 beef cattle, 4,477 dairy cattle, 18,300 swine, 7,497 sheep and goats, and 52,378 chickens and other poultry, with a total value of \$1,882,940. In 1919 dairy products, excluding those used at home, were valued at \$83,047; poultry and eggs at \$83,967; and wool and mohair at \$1,821. In the decade 1909-1919 there was a very large increase in the numbers of beef cattle, dairy cattle, swine, and poultry in the county, and the total value of livestock and livestock products increased nearly 10 times.

Most farmers in the county keep one or more cows to provide dairy products for home use. A few dairy herds in the vicinity of Port Gibson supply the local market with milk, cream, and butter. A small cream station at Port Gibson collects and ships cream to Vicksburg. Cows used for dairy purposes are largely Jersey or Jersey grades, but there are also large numbers of nondescript cattle which receive little artificial shelter from the elements and little feed other than pasture. In recent years many well-bred beef cattle, principally Herefords, have been introduced, and improvement of native cattle and production of a better quality of beef animals is on the increase. Beef cattle are pastured on Bermuda grass and Lespedeza pastures on the rougher parts of upland farms, in old fields in the steep broken country of the bluff region, where considerable wild switch cane is available, and on bottoms not suited for cultivation. The outside markets for beef cattle are St. Louis, Vicksburg, and New Orleans. The county is tick free.

Most farmers raise a few hogs, chiefly Poland China and Duroc-Jersey. Large numbers are utilized for home and local meat supply, and a few carloads are shipped annually to St. Louis and New Orleans. Hogs are pastured on Bermuda grass and Lespedeza (in winter on oats) and are frequently turned into corn and cowpea fields in the late summer and fall. There are a few small herds of sheep and goats in the rough upland sections of the county.

Poultry, principally chickens, is kept on nearly every farm. American breeds are preferred. Turkeys, geese, guineas, and ducks are seen on some farms. Comparatively few shipments of poultry products reach outside markets.

The farmers of Claiborne County recognize that the best yields of cotton are obtained on well-drained bottom lands, provided early planting of quick-maturing varieties is practiced. In wet seasons favorable for the spread of the boll weevil it is well known that more damage is done to ranker-growing bottom-land cotton than to that grown on terraces and uplands. Also, it is known that cotton

rarely makes productive yields on poorly drained cold or wet soils, because of its late start and slower growth. The crop produces well in favorable seasons on well-drained upland and terrace soils, doing best on well-cultivated fertile fields which have not been badly washed or eroded. Corn is known to do best on well-drained bottoms, and oats on the Memphis, Grenada, Lintonia, and Olivier silt loams. For the cultivation of tomatoes, very well-drained upland fields of Memphis silt loam, particularly small fields on ridges in the broken phase of this soil, are preferred.

Stream-bottom soils are the most successful producers of sugarcane and sorgho. Bottom-land pastures maintain a better sod than is usually found on the uplands. Some small pecan orchards located on well-drained bottoms of Vicksburg silt loam are doing well. Tree fruits do best on the Memphis and Lintonia silt loams.

Farm buildings throughout the county in general are small. Large old plantation dwellings are still standing in places, but many are vacant and falling into decay, the owners living in town and the land being rented out. There are a few good-sized barns, a few silos, and a small number of well laid out and equipped farmsteads. Most of the farms are not well equipped, however, with barns, stables, or implement sheds. Homes are small, and few are fitted with modern conveniences.

The work animals consist of mules and horses, few of which are large-type draft animals. The commonest implements are the 1-horse type, but heavier and more efficient tools are coming into use on the better plantations. Tractors are in use on several farms situated on smoother uplands, terraces, and bottom lands.

According to the census of 1920, the value of all property to the farm is \$3,608, of which the land represents 52.3 per cent, buildings 16.5 per cent, domestic animals 24.3 per cent, and implements 6.9 per cent.

Crop rotation has not been generally practiced in Claiborne County, except in occasionally alternating cotton with corn. Some farmers follow cotton with oats, graze the latter during winter, and after harvesting the grain plant corn and cowpeas, returning the land to cotton the following spring.

The value of commercial fertilizer used in the county in 1899 was \$2,830; in 1909, \$6,472; and in 1919, \$3,730. Fertilizer is coming into more general use.

Mixtures of nitrate of soda and superphosphate (acid phosphate)—1 part of the former and 2 parts of the latter by weight—in amounts ranging from 200 to 500 pounds to the acre have been most commonly used for cotton. Similar amounts of commercial fertilizer of 3-10-3¹ or 3-8-3 analysis are also used. Small amounts of cottonseed meal are occasionally applied with superphosphate. The use of lime is rare. Available barnyard manure is usually placed on gardens. Heavier applications, from 500 to 800 or more pounds to the acre of commercial fertilizer of approximately 3-10-3 analysis, are used for the early tomato crop.

There has been a scarcity of labor since the boll-weevil invasion. Many planters report great difficulty in obtaining and keeping reli-

¹ Percentages, respectively, of nitrogen, phosphoric acid, and potash.

able tenants. Day labor now receives from \$1 to \$1.75. Cotton pickers are paid about 75 cents a hundred pounds of seed cotton. Expenditure for labor in 1919 was reported on 546 farms, and the total expended was \$118,841, or an average of \$217.66 a farm.

The 1920 census reported a total of 2,154 farms in Claiborne County, embracing 78.1 per cent of the total area. The average size of farms is 113.5 acres. Of the farm land, 46.4 per cent or an average of 52.7 acres to the farm is classed as improved.

According to the census, tenant operation of farms as compared with owner operation was at its maximum about 1900, when four times as many farms were operated by tenants as by owners. In 1920, 25.4 per cent of the farms of the county were operated by owners, 73.8 per cent by tenants, and 0.8 per cent by managers.

The annual renting agreement, on a share system of one-fourth of the cotton and corn produced or one-third of the cotton only for the owner, with only land and buildings supplied, is most common. When everything necessary except labor is supplied by the owner, he receives half the crops raised. From \$3 to \$5 an acre is the usual cash consideration, when land is rented on a cash basis.

The average value of land in 1920 is given by the census as \$16.63 an acre, which is nearly double the corresponding figure for 1910. The selling price of land depends on the soil, relief, improvements, and distance from towns and shipping points, ranging from \$25 to \$60 an acre for the better farm lands in the better-developed sections to \$5 an acre or less for wet bottom land subject to frequent overflow and other land unsuited for agriculture. The valuation of a given wooded tract is largely dependent on the market value of the timber.

SOIL SERIES AND TYPES

The soils of the county have been separated into soil series, types, and phases, and the areas of each are shown on the accompanying soil map.

On the uplands, the soils of the Memphis series are most extensive. The silt loam with a smooth phase and a broken phase, and the silty clay loam are mapped. Typical Memphis silt loam consists of light-brown silt loam with a buff silty clay subsoil. Memphis silty clay loam is similar, but over the greater part of it the original silt loam surface soil has been removed by erosion.

The only other upland soils mapped are the Grenada. Typical Grenada silt loam is light-brown silt loam, with a yellowish-brown silty clay upper subsoil layer and a compact mottled lower subsoil layer containing iron concretions. A broken phase mapped differs from the typical soil chiefly in that it has broken, hilly relief. Grenada silty clay loam is similar to the silt loam except in the texture of the surface soil.

The terrace soils include members of the Lintonia, Olivier, and Calhoun series. Lintonia silt loam, the only soil of that series mapped, is brown silt loam with a buff or yellowish-brown silty clay subsoil; Olivier silt loam, representing the Olivier series, has a brown silt loam surface soil and a yellowish-brown silty clay subsoil mottled with gray; and Calhoun silt loam, the only Calhoun

soil mapped, has a yellow and gray mottled silt loam surface soil and a strongly mottled gray or solid gray silty clay subsoil.

The bottom-land soils, aside from those in the Mississippi bottoms, belong to the Vicksburg, Collins, and Waverly series. The Vicksburg soils, of which the fine sandy loam, very fine sandy loam, and silt loam are mapped, have brown surface soils and yellowish-brown subsoils of similar or slightly heavier texture. The Collins soils, of which the very fine sandy loam, silt loam, and silty clay loam are mapped, have brown surface soils and mottled slightly heavier subsoils. The Waverly soils are yellow and gray mottled in both surface soil and subsoil. The subsoils are somewhat heavier textured than the surface soils. Waverly silt loam and Waverly silty clay loam are mapped.

On the Mississippi River bottoms the soils belong to the Sarpy and Sharkey series, the chief distinctions between the two being that the subsoils of the Sarpy soils are prevailingly sandy, regardless of the surface textures, whereas those of the Sharkey soils are heavier and mottled. The Sarpy soils have brown or grayish-brown surface soils and yellowish subsoils; the Sharkey are dark grayish brown, characteristically mottled in both surface soil and subsoil. The very fine sandy loam with a low phase, silt loam with a low phase, and clay soils of the Sarpy series and the clay of the Sharkey series are mapped.

In addition to the soils mentioned river wash, a miscellaneous class of material, is mapped.

Table 3 shows the acreage and proportionate extent of the several soils mapped in Claiborne County.

TABLE 3.—*Acreage and proportionate extent of the soils mapped in Claiborne County, Miss.*

| Type of soil | Acres | Per cent | Type of soil | Acres | Per cent |
|-------------------------------------|--------|----------|---------------------------------|---------|----------|
| Memphis silt loam..... | 54,400 | 51.4 | Collins silt loam..... | 14,080 | 4.6 |
| Broken phase..... | 97,344 | | Collins silty clay loam..... | 448 | .2 |
| Smooth phase..... | 5,248 | | Waverly silt loam..... | 4,928 | 1.6 |
| Memphis silty clay loam..... | 12,864 | 4.2 | Waverly silty clay loam..... | 6,656 | 2.2 |
| Grenada silt loam..... | 26,432 | 9.5 | Sarpy very fine sandy loam..... | 2,624 | 1.8 |
| Broken phase..... | 2,560 | | Low phase..... | 2,624 | |
| Grenada silty clay loam..... | 8,000 | 2.6 | Sarpy silt loam..... | 512 | .2 |
| Lintonia silt loam..... | 17,536 | 5.8 | Low phase..... | 128 | |
| Olivier silt loam..... | 2,496 | .8 | Sarpy clay..... | 3,008 | 1.0 |
| Calhoun silt loam..... | 448 | .2 | Sharkey clay..... | 14,464 | 4.7 |
| Vicksburg fine sandy loam..... | 704 | .2 | River wash..... | 2,880 | .9 |
| Vicksburg very fine sandy loam..... | 2,752 | .9 | | | |
| Vicksburg silt loam..... | 21,440 | 7.0 | | | |
| Collins very fine sandy loam..... | 704 | .2 | Total..... | 305,280 | ----- |

MEMPHIS SILT LOAM

To a depth ranging from 6 to 12 inches, the surface soil of Memphis silt loam in cultivated fields consists of light-brown or brown smooth friable silt loam, which when very dry appears grayish brown and when wet dark brown. The subsoil, extending to a depth of $3\frac{1}{2}$ or 4 feet, is buff-colored smooth moderately plastic granular silty clay or silty clay loam. This grades into yellowish-brown somewhat more friable heavy silt loam which in turn grades, at a

depth of approximately 10 feet, into the yellowish smooth floury silt loam unweathered parent material. The surface soil and upper part of the subsoil are moderately acid in reaction; the lower part of the subsoil normally becomes neutral at a depth of 8 or 10 feet; and the parent material is calcareous, containing scattered soft accumulations and some concretions of lime. (Pl. 1, A.)

The more rolling fields of this soil, especially on the upper slopes, narrower ridges, and eroded places where sheet wash has been most effective, appear faintly reddish or buff colored where the subsoil, on plowing, has been thrown to the surface. In parts of the county, particularly in old fields where erosion has been very active, strips and spots of exposed subsoil give a patchy appearance to freshly plowed fields. Where such a condition predominates, the soil has been mapped as Memphis silty clay loam. East of a north-and-south line near Pattison, in that part of the county where the coastal-plain formation begins to show in road cuts and the loessial mantle is only from 4 to 8 feet thick, the surface soil of Memphis silt loam becomes shallower, in general being from 4 to 6 inches deep, and areas of Memphis silty clay loam are numerous. This soil is not so brown as typical Memphis silt loam, the upper part of the subsoil shows less buff tint, and yellow and gray mottling is more pronounced between depths of 24 inches and 4 feet. Compaction of the lower part of the subsoil is lacking, as is also a calcareous substratum of parent loess. The soil mass is strongly acid in reaction throughout. There is less hardwood and more pine on such areas than elsewhere, and the soil is less productive than typical Memphis silt loam.

In a very few places at the base of slopes or in small sags or flat or depressed spots small areas or strips profusely mottled with gray and very compact, both in the surface soil and subsoil, have been included in mapping. These patches remain soggy for a long time following rains. Many of them contain numerous iron concretions. They result from local bad drainage conditions or seepage and are not fertile. They are of small extent and are unimportant.

Memphis silt loam is the most extensive cultivable soil in the county and the most important upland soil. In the western part of the county, in the bluff region, small areas of this soil occur on the tops of divides and ridges. Larger areas are near Russum and Port Gibson, extending eastward to Tillman, Pattison, Hermanville, and Carlisle. Some outlying areas are elsewhere. A rather small proportion of the land is undulating,² but most of it is rolling, with numerous small steep-sided draws and drainage ways.

Drainage of this soil is as a whole very good. Oxidation is thorough and deep, and the land drains surprisingly well after heavy rains. This is a drought-resistant soil and is important agriculturally, 65 per cent of it being in cultivation. The remainder is in timber of mixed hardwoods and pine.

The principal crops are cotton and corn, but oats, cowpeas, velvet-beans, soybeans, Lespedeza and other clovers, Bermuda grass, sorgo, ribbon cane, potatoes, cabbage, and tomatoes are also grown with

² Several topographic distinctions were made in phase mapping of soils in this county. No instruments were used in determining gradients, and there are border-line areas which might have been placed in either of the two topographic groups. Boundaries are estimations but are as nearly accurate and as true to description as careful observation and judgment could determine.

good results. Lespedeza yields from 1 to 2 tons of excellent hay to the acre in two cuttings. A small proportion of this crop is grown for seed. Red clover apparently does best in the western part of the county, possibly on account of the greater abundance of deep subsoil lime. Bur clover does well. Some crimson clover is grown, but not so successfully up to the present as bur clover. White clover grows wild in most pastures. Vetch does well when planted with oats for forage. Vegetables and fruits are grown for home use.

Cotton yields from one-fourth to one-half bale to the acre, depending largely on the extent of damage by the boll weevil. A bale to the acre is obtained in good seasons on the better farms. Corn is not ordinarily so well cared for as cotton. The average yield is from 15 to 25 bushels to the acre, but some farmers report 40 bushels.

Some fertilizers are used, chiefly for cotton. The commonest fertilizer treatment is from 200 to 400 pounds to the acre of superphosphate and nitrate of soda or of ready-mixed commercial fertilizer of about 2-8-2 or 3-8-3 formula.

During the last 15 years there has been a marked increase in the raising of beef cattle and hogs on this soil. Commercial dairying is carried on to some extent near Port Gibson. Pastures are excellent.

Improved land of this kind commands between \$15 and \$50 an acre, depending on improvements, relief, condition of the soil, and distance from towns and shipping points.

Methods of increasing the productivity of this soil include earlier and deeper plowing and more extensive use of legumes in rotation with cotton and corn. Much land has been rendered unproductive and is "lying out" because of too shallow plowing, causing the formation of a sole, and too constant production of cotton, causing depletion of organic matter. Whenever practical, flat breaking to a depth of 7 or 8 inches soon after harvest is recommended, followed by thorough disking. Winter cover crops plowed under will furnish badly needed organic matter to the surface soils. Moderate applications of lime have been found valuable in improving tilth and stimulating productivity. Terracing should be extensively practiced as the best means of checking field erosion. (Pl. 1, B.)

Memphis silt loam, smooth phase.—The smooth phase of Memphis silt loam is almost identical in profile to the typical soil. It has a more uniform and slightly deeper surface soil, as a rule, consisting in cultivated fields of smooth light-brown silt loam from 10 to 15 inches deep. The subsoil of buff silty clay or silty clay loam gives way, at a depth of 3 or 4 feet, to a gradational layer of yellowish silty clay loam or silt loam below which is the parent material of calcareous silt, lying from 10 to 15 feet below the surface. The surface soil and subsoil are acid in reaction and the parent material is alkaline.

The soil in cultivated fields is brown or grayish brown, appearing dark brown when wet. There are no appreciable inclusions of other soils, but in local flattish areas some subsoil mottling was found. Practically all this soil is smooth surfaced, as the name implies, and suitable for cultivation with modern machinery.

Broad areas of this phase of soil occur near Pattison and Barland; smaller scattered areas are 6 or 8 miles west and southwest of Port Gibson. In the bluff region and near the Mississippi bottoms areas

break off abruptly at their edges into the steep slopes of Memphis silt loam, broken phase. Such areas are locally called flat hills. It is possible that they are ancient very high terraces of Mississippi River.

Areas of this soil are gently undulating, gently sloping, or nearly flat and are markedly smooth without interruptions or breaks, such as steep-sided draws or gullies, to interfere with cultivation. Of all the upland soils this is the most valuable, most highly developed, and most productive. Erosion and sheet wash are so slight that contour bedding and terracing are not needed in many places. Drainage conditions are good, as a rule, although the run-off is less rapid than on typical rolling Memphis silt loam. Internal drainage is well established.

This is not an extensive soil, but 85 or 90 per cent of it is in cultivation, largely to cotton and corn. Cotton yields from one-half to three-fourths bale to the acre, with moderate fertilization, and corn from 25 to 35 bushels. Oats, cowpeas, vegetables, fruits, and other miscellaneous crops are grown, and some dairy cattle, beef cattle, and hogs are raised. Lespedeza and other clovers and Bermuda grass make excellent pastures. The recommendations for the improvement of typical Memphis silt loam apply to this phase. It is practical to use heavier machinery and tractors on this soil in place of the insufficient 1-mule plows in common use.

This land commands from \$20 to \$50 an acre, depending on improvements and location with reference to towns and shipping points.

Memphis silt loam, broken phase.—The broken phase of Memphis silt loam is very hilly and deeply dissected. It occurs in the bluff or cane-hill region of the uplands. On the tops and crests of ridges it consists of light-brown friable silt loam, from 6 to 12 inches deep, underlain by buff silty clay or silty clay loam grading below a depth of 3 or 4 feet through yellowish-brown heavy silt loam and silt loam into soft floury calcareous silty parent material lying at a depth ranging from 10 to 15 feet below the surface. It is thus identical with typical Memphis silt loam wherever the relief is such that the material has lain in place long enough to have become thoroughly weathered. At least 90 or 95 per cent of this phase of soil, however, is extremely rough and broken and is not maturely weathered. This material differs from typical Memphis silt loam in that the distinction between surface soil and subsoil is not well marked, as there is very little migration of clay from the surface soil to the subsoil. On steep slopes in woodland the 1 or 2 inch surface layer consists of dark-brown highly organic silt loam, containing accumulations of forest decay. This is underlain to a depth ranging from 3 to 10 feet by yellowish-brown or yellow silt loam or heavy silt loam. The tendency toward the formation of the buff or yellowish-brown silty clay subsoil below a depth ranging from 6 to 12 inches is more noticeable on the slopes of less gradient; on the steeper grades there is no trace of a heavier subsoil. The parent material, likewise, lies at a variable depth, depending on the degree of slope, and is exposed in many places. The soil on the steepest grades is calcareous near the surface, and in other places tests show moderate acidity to a depth ranging from 3 to 8 feet.

A few very hilly and badly gullied areas of Memphis silty clay loam, occurring in the eastern part of the county, were included

with this broken soil. Very small included strips of Lintonia silt loam, steep phase, occupying the steeply sloping faces of rather high terraces are 5 miles west of Port Gibson and near Grand Gulf. In the bluffs on the south side of the Bayou Pierre Valley, 3 miles west of Port Gibson, and in a few other localities small strips of Houston black clay, Houston silty clay loam, and similar material mixed with weathered loess were included with this phase of soil on account of their small extent. The black clay is residual from limestone, outcropping on the steeper slopes in places. It is of no agricultural significance in this county. Gravel banks in coastal-plain material exposed in many of the deeper cuts and on steeper slopes at Rocky Springs, Willows, 5 miles southwest of Port Gibson, and elsewhere are an important source of gravel for road building. In the northeastern part of the county there are small included areas of Lexington soils, which are found where the coastal-plain materials come within 2 or 3 feet of the surface. Drainage is excellent, the run-off being very rapid.

Large areas of this broken soil are in the Scutchillo Hills and Petit Gulf Hills. Some outlying areas are mapped between Bayou Pierre and Little Bayou Pierre, northeast of Port Gibson. Smaller areas are southeast of Carlisle and elsewhere on the uplands.

Formerly a considerable proportion of even the steep slopes was planted to cotton. Though erosion on such slopes was severe, these steep lands were very productive. The increasing cost of labor on such very hilly small fields ultimately caused their abandonment for cropping, and nearly all have reverted to forest and hill pastures. A few narrow winding fields in cotton or corn are seen on some of these steep slopes, and small semicircular fields are on the lower slopes around the heads of draws. This is now an unimportant agricultural soil, less than 5 per cent being in cultivation and the remainder in timber and woods pastures. Cotton, corn, cowpeas, and vegetables are the principal crops. Cotton yields from one-fourth to one-half bale to the acre and corn from 15 to 25 bushels. In the vicinity of Rocky Springs and Reganton many farmers grow small fields of early tomatoes. The rapidity with which the soil becomes dry enough to work following rains is a decided advantage in the production of early vegetables. Some of the former tilled acreage is given over to pastures for hogs and beef cattle. Some goats and a few sheep are raised. Many small abandoned fields are rapidly growing up to timber.

The productiveness, range of crops that may be grown, and general soil management are the same as for typical Memphis silt loam.

Land of this kind sells for \$5 or \$10 an acre or more, depending largely on the value of the timber stand.

MEMPHIS SILTY CLAY LOAM

Memphis silty clay loam is identical in all respects with typical Memphis silt loam, except that the surface soil is largely lacking. In cultivated fields, traces of light-brown silt loam occur on the surface, but are so intermixed with the subsoil on plowing that the prevailing surface soil is reddish-brown or buff-colored heavy silt loam or silty clay loam, low in organic matter, cloddy, and difficult to work. Below plow depth, the subsoil is buff silty clay or silty clay loam,

grading into heavy silt loam at a depth of 3 or 4 feet. This in turn grades into calcareous silty parent material at a depth of 10 or 15 feet.

This soil is not sharply defined. In mapping, most of the eroded areas of the Memphis soils were included, and consequently the boundaries shown are in many places suggestive of the conditions, rather than indicative of abrupt changes of soil. In places where the former surface soil has been washed down slopes, some of it collected on lower slopes and bottoms, thus broadening the alluvial strips along numerous small streams. The soil is moderately or strongly acid.

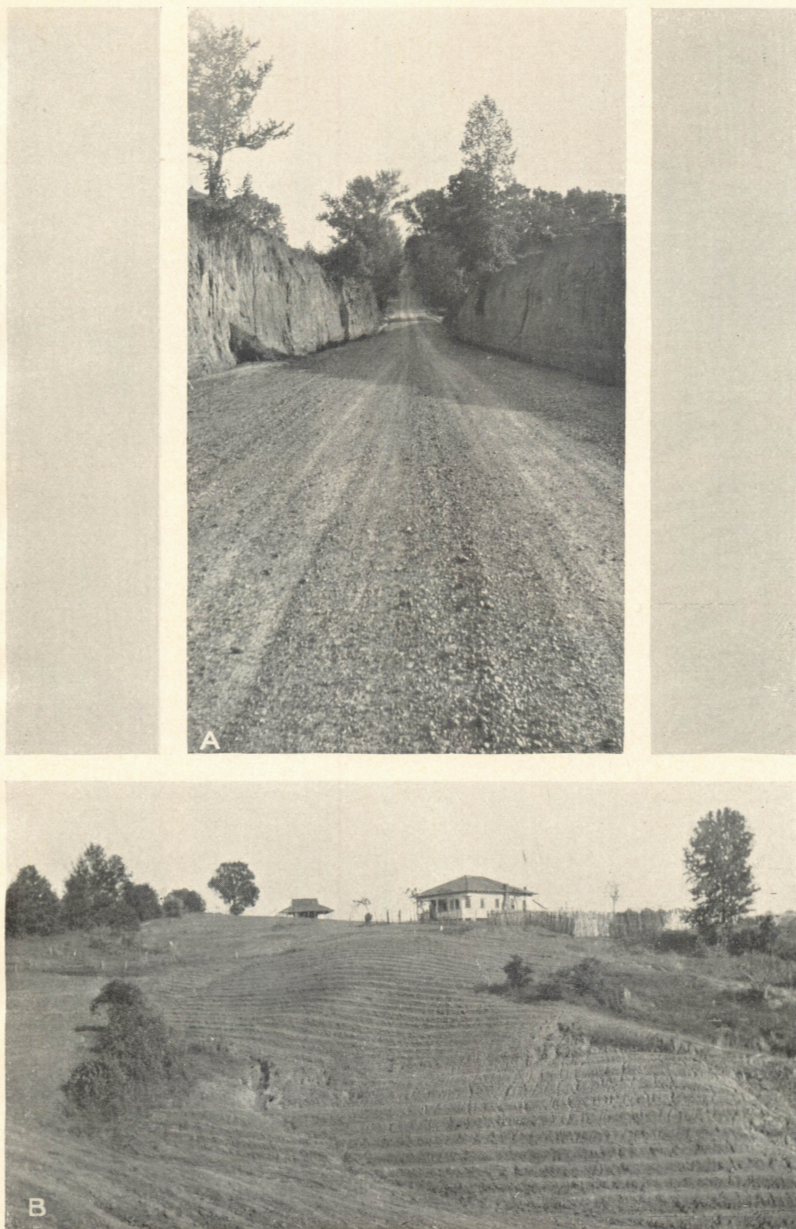
The principal areas of this soil are in the eastern and southeastern parts of the county, east of Pattison, Hermanville, and Carlisle. The soil is most common in that region where the Memphis soils give way to the Grenada. Near the line of contact some subsoil compaction and mottling is noticeable, and small areas of the Grenada soils are included.

Areas of this soil are characteristically rolling or hilly. The surface configuration has been very much altered by erosion, which has given rise to a very distinctive feature of the soil. (Pl. 2, A.) Extending back upslope from the natural drainage ways are large numbers of gullies and washes, branching out and in some places reaching well up to the crests of divides. These are cut to a depth ranging from 4 to 20 feet below the general land level. They broaden out in time, and fields are soon so badly cut up as to make cultivation in many places impossible. Associated with this destructive gullying, extensive sheet wash has been effective in ruining most of the surface for cropping purposes.

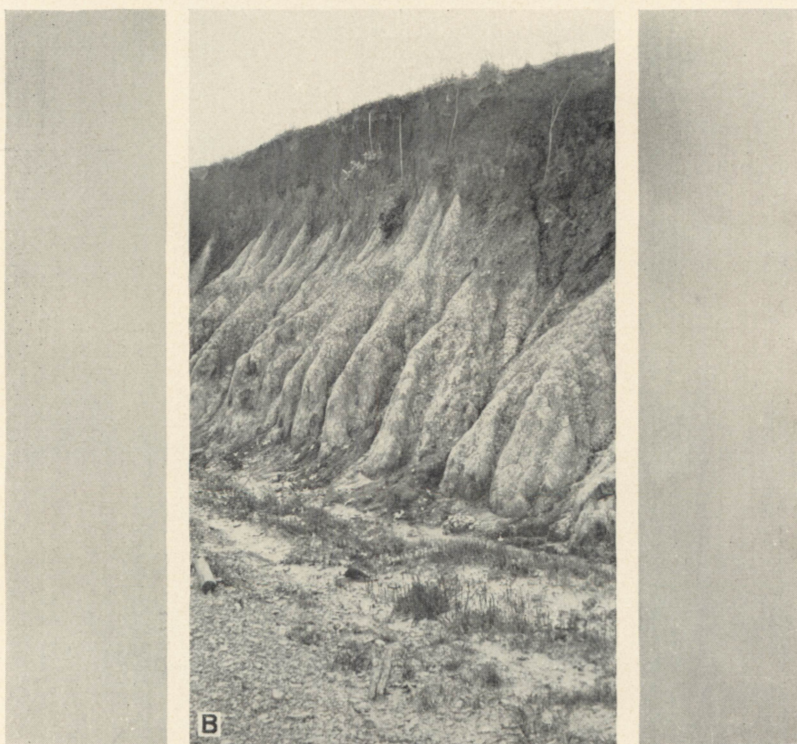
Drainage is excellent and the soil is inclined to be droughty. It is not important agriculturally, about 30 per cent being in cultivation. The greater part is in abandoned fields, upland pastures, and timber. Some cotton is raised, with small applications of fertilizers. Yields are low and rather uncertain. Corn production has been largely abandoned. Some cowpeas, potatoes, and early tomatoes and other vegetables are grown. Lespedeza and Bermuda grass thrive, except on the more barren places where erosion is most active. These crops form a sod, tending to hold the soil in place. Reforestation of all the steeper slopes is taking place naturally and is to be encouraged as perhaps the best means of utilizing these lands and checking erosion.

Continuous cropping, mainly to cotton, with no attention to maintaining the humus supply of the soil, has also been instrumental in causing depletion of fertility. Clean cultivation of fields on slopes unprotected by terracing has allowed serious washing. There are many abandoned houses on this soil. Most of the land formerly cultivated is now pastured by beef cattle and hogs.

Incorporation of large amounts of organic matter, best effected by growing legumes and turning them under, will be required to restore fertility for cropping purposes. Filling of gullies and construction of terraces are the first requisities. Brush dams, held in place by wire and stakes placed at intervals in the gullies will cause them to fill up. In old pastures, erosion can be checked to some extent by plant growth. Old field pine, black locust, old field plum, wild



A, Memphis silt loam standing vertical in a cut along a road; B, cultivated steep slope on Memphis silt loam, showing erosion through contour beds



A, Distinctive erosion of Memphis silty clay loam; B, vertical cut of Grenada silt loam showing slanting butresses of coastal-plain clays

honeysuckle, and Lespedeza and Bermuda grass all serve to hold the soil in place. The cloddy intractable condition of the exposed red clay subsoil material can doubtless be improved by applying lime, as the soil mass is moderately or strongly acid. Additions of phosphatic fertilizer, together with the use of suitable rotations and good cultivation, are needed to make cultivable areas productive.

Land of this kind commands from \$5 to \$15 an acre.

GRENADA SILT LOAM

Grenada silt loam in cultivated fields consists of smooth friable brown or light-brown silt loam about 8 inches deep. The subsoil, between depths of 8 and 24 inches, is yellowish-brown moderately plastic granular silty clay or silty clay loam, tinted buff in many places. This is underlain to a depth of 4 feet by a semihardpan layer consisting of mottled and streaked yellowish-brown and light-gray silty clay or silty clay loam, considerably compacted, moderately plastic when wet, and hard when dry. This layer commonly contains many small iron concretions. From 4 to 8 feet below the surface, in places where the silty loessial parent material extends to that depth, there is slightly compact mottled and streaked yellowish-brown and light-gray silt loam or heavy silt loam. At a depth of 8 feet or less, this soil is underlain by the sandy clays and clays of the coastal-plain formations. (Pl. 2, B.) The reaction of the entire soil is moderately or strongly acid.

In cultivated fields the surface soil of Grenada silt loam is light brown, showing light grayish brown when dry and dark grayish brown when wet. In the older cultivated fields, especially on upper slopes in rolling country where erosion has been most active, the yellowish-brown or buff-colored silty clay loam subsoil is exposed in many places. Where such eroded areas are predominant, the soil has been mapped as Grenada silty clay loam.

Areas of this soil occur only in the eastern part of the county, mainly in the southeastern part. Some large areas are east of Clarks Creek, Hermanville, and Carlisle. The land is undulating or rolling. Surface drainage is good, but internal drainage is sluggish on account of the compactness of the deeper subsoil. This is not a serious hindrance to cultivation of most crops on the rolling areas, but on the gentler slopes it tends to make the soil soggy and late and checks rapid growth in wet seasons.

This is not a very extensive or important soil in this county. About 50 per cent is in cultivation, and the remainder is in timber and pastures. Pines are more numerous than on any other soil in the county. Crops grown and soil management are the same as on the Memphis soils.

Land of this kind commands from \$10 to \$25 an acre, depending on improvements and distance from towns and shipping points.

For increasing the productivity of this soil deeper plowing, increase of the humus content, the use of moderate amounts of fertilizer, and rotation of crops are recommended. The addition of 1 ton of ground limestone every five years is suggested as a means of correcting acidity and stimulating productiveness.

Grenada silt loam, broken phase.—Grenada silt loam, broken phase, consists of dark grayish-brown silt loam about 2 inches thick underlain by yellowish-brown or yellow silt loam continuous to a depth ranging from 8 to 12 inches. Beneath this layer lies yellow heavy silt loam or silty clay loam, which gives way at a depth ranging from 24 to 40 inches to compact silty clay mottled with gray and carrying iron concretionary material. Below this, coastal-plain materials occur at a depth ranging from 4 to 8 feet.

Grenada silt loam, broken phase, is mapped along the Hinds-Claiborne County line 4 or 5 miles south of Reganton, along the Copiah-Claiborne County line 6 miles east of Hermanville, and in the southeastern corner of the county. This soil is all in forest of mixed hardwoods and loblolly pine and is of no importance agriculturally except as pasture. Bermuda grass and Lespedeza grow in open spaces. The soil has the same relief as Memphis silt loam, broken phase.

Even though the loessial mantle from which the Grenada soils have been derived is only from 4 to 8 feet in thickness in most places, in nearly all this broken soil it is sufficiently thick to justify mapping as a Grenada soil rather than as Lexington. In a few places on the upper rims of valleys on upper slopes outcrops of coastal-plain materials are seen, and on a few hilltops all traces of the loess have been washed away, exposing gravel and sandy clays. Gravel pits are located in some such places. Surface drainage is excellent, but internal drainage and aeration are defective.

This soil commands \$5 an acre and upward, depending on the value of the timber growth.

GRENADA SILTY CLAY LOAM

Grenada silty clay loam is identical with Grenada silt loam, except that the surface soil has been largely washed away. In some places in cultivated fields some of the original surface soil of light-brown silt loam remains, but the prevailing surface soil after plowing is buff or yellowish-brown silty clay loam, a mixture of the scant silt loam surface covering and the raw unproductive subsoil. Below plow depth the subsoil is yellowish-brown or buff silty clay, becoming compact and mottled and containing soft iron concretions at an average depth between 24 and 40 inches. Less compact mottled silty clay loam or silt loam underlies this. Coastal-plain beds are reached from 4 to 8 feet below the surface.

As in Memphis silty clay loam, the boundaries of this soil are not sharply defined, and exact mapping is impossible on the scale used. Some small areas of Grenada silt loam were included.

This is neither an extensive nor important soil. Areas are from 2 to 10 miles south of Insmore along and near the Copiah-Claiborne County line, in the vicinity of Peyton, and in the southeastern part of the county. The land is rolling or hilly. Surface configuration is very similar to that of Memphis silty clay loam, but in this soil sheet wash and gulying have reached the extreme in many areas, so that the land is utterly ruined. The presence of beds of easily undermined and eroded sandy clays has caused rapid caving-in about deep gullies, so that broad wastes of barren land and stretches of bad-land relief are conspicuous. There are numerous bare spots

where grasses have not been able to establish themselves. On account of the poor physical condition of the surface soil and slow moisture-absorptive ability, this soil is inclined to be droughty. Cotton is about the only crop raised. Yields are low. Old fields are utilized for hill pastures and timberland.

This soil commands from \$5 to \$15 an acre, depending on local conditions of soil and relief and on the value of the timber.

Methods recommended for improving Memphis silty clay loam apply also to this soil, which is probably the poorest upland soil in the county.

LINTONIA SILT LOAM

In cultivated fields the surface soil of Lintonia silt loam consists of friable yellowish-brown smooth silt loam, from 12 to 15 inches thick. The subsoil to a depth of 36 inches is buff granular and moderately plastic silty clay. Between depths of 3 and 8 feet the lower part of the subsoil consists of silty clay loam grading into buff or light-brown silt loam. Below a depth of 8 feet, the material is pre-vaillingly light-brown friable silt loam. The entire soil is moderately acid in reaction.

Lintonia silt loam occupies well-developed terraces, many of which stand 30 or 40 feet above the streams, and has reached a rather mature stage of weathering. The areas are overflowed very rarely if ever. Probably the highest terraces are at Port Gibson and between this town and Pattison. Small areas of Olivier silt loam and Calhoun silt loam were included in mapping.

The principal areas of Lintonia silt loam are in the valleys of Bayou Pierre, Little Bayou Pierre, Clarks Creek, Willis Creek, and the upper half of Big Black River Valley. The land is mainly flat or gently sloping toward the streams. Several successive levels are seen in places, and there are local swells, low mounds, or inequalities. The slopes from terraces to bottoms are rarely extensive enough to be shown on the map. Drainage is good. Run-off is not so rapid following rains as on the rolling upland soils but is ample, except in a few very flat areas.

This is an important agricultural soil and more than 90 per cent of it is in cultivation. It is the most highly developed and best terrace soil in the county. It is very similar to Memphis silt loam, smooth phase, in relief, configuration, color, character of soil material, profile, reaction, crop adaptation, and value.

OLIVIER SILT LOAM

Olivier silt loam consists of light-brown smooth friable silt loam, from 8 to 15 inches deep, underlain by yellowish-brown or yellow silty clay loam which becomes mottled with gray at a depth of about 24 inches. In places slight compaction was noted in the lower part of the subsoil. Such areas are generally very flat and show a bluish-gray deep subsoil layer and some iron concretionary formation throughout the soil. Small areas of Lintonia silt loam and Calhoun silt loam are also included.

This is a smooth river-terrace soil occurring at Insmore and in the upper parts of Little Bayou Pierre and Clarks Creek Valleys. It is

mainly flat or gently sloping toward the streams. Drainage is fairly good over most of the soil, although run-off is slow. Internal drainage is defective, as the mottled condition of the subsoil indicates. Like Lintonia silt loam, this soil occurs principally in broad areas from 10 to 25 feet above the streams. Both surface soil and subsoil are strongly acid.

This is not a very important soil, although 80 per cent is in cultivation. Cotton and corn are the main crops grown, in spite of the fact that the soil is rather late and cotton is likely to suffer more from boll-weevil damage than when planted on better-drained and earlier soils. Oats do well. Bermuda grass and Lespedeza are grown for pasture and hay. Some ribbon cane and sorgho are produced.

This soil commands from \$15 to \$40 an acre, depending on distance from towns and transportation lines.

CALHOUN SILT LOAM

Calhoun silt loam consists of mottled yellowish and gray or of light-gray silt loam, from 10 to 15 inches deep, underlain by light-gray somewhat compact silty clay loam, blotched and streaked with dark and rust-brown iron stains. Small dark-brown iron concretions occur in both surface soil and subsoil.

Areas are flat or depressed and occur between upland and the better-drained terrace soils. Pondered flat wooded patches occur in places in association with Lintonia silt loam and Olivier silt loam. Most of the soil is swampy and wooded, and water stands on it for long periods following rains. About 30 per cent of the land, mainly areas included in large fields of better-drained terrace soils, is cultivated to cotton and corn. It is doubtful whether attempts to cultivate this soil without artificial drainage are practical. Both surface soil and subsoil are strongly acid, the content of organic matter is low, and, in its present condition, fertility is also low. Timbered areas support a growth of willow, water oak, swamp white oak, black gum, and some cypress.

Land of this kind sells for \$5 or \$10 an acre.

VICKSBURG FINE SANDY LOAM

Vicksburg fine sandy loam consists of light-brown or brown fine sandy loam or fine sand, from 12 to 15 inches deep, underlain by yellowish-brown fine sandy loam or very fine sandy loam. There is some stratification of assorted coarser material in the subsoil, but as a rule the subsoil texture is somewhat finer than that of the surface soil. Some very small strips of coarse sandy and gravelly river wash are included, as are also small areas of associated bottom-land soils. The surface soil and subsoil are moderately acid in reaction.

This soil occurs almost exclusively in patches at or near the channel banks of Bayou Pierre and Little Bayou Pierre. Most areas lie at the lower levels, where the more rapid stream flow has spread at times of overflow; these areas are wooded. A few tracts on the more elevated banks are usually cultivated. The land is nearly flat or gently sloping. The configuration of the soil is irregular, with small sags and swells and overflow channels. Drainage is good.

This soil is unimportant. About 20 per cent is in cultivation to cotton and corn. The selling price depends on the nature and value of surrounding soils with which this soil is included in farms.

VICKSBURG VERY FINE SANDY LOAM

Vicksburg very fine sandy loam consists of light-brown or brown very fine sandy loam from 12 to 15 inches deep, underlain by yellowish-brown loam or heavy very fine sandy loam. Some small areas of Vicksburg fine sandy loam are included.

This soil occurs in the bottoms of James Creek, of Little Bayou Pierre near Port Gibson, and of Bayou Pierre north of Carlisle and Insmore. Small areas are elsewhere in the county. The surface soil and subsoil are moderately acid in reaction.

This soil is nearly flat or slopes gently toward the streams. The surface is fairly smooth, being less irregular, as a rule, than that of Vicksburg fine sandy loam. Drainage is well established in nearly all areas.

Vicksburg very fine sandy loam is not important agriculturally. About 25 per cent is in cultivation, largely to corn and cotton. Most of the land lies in fairly low positions adjacent to stream channels, where it is inundated to such an extent that only a small proportion has been cleared. Some areas on the higher banks, extending back for considerable distances in places, are cultivated. They are well drained, early, and productive. A strong growth of mixed hardwoods flourishes on the uncleared tracts, and the open spaces support an excellent sod.

The value of this soil depends on that of the soils with which it is included in farms.

VICKSBURG SILT LOAM

Vicksburg silt loam consists of brown mellow silt loam from 10 to 15 inches deep, underlain by yellowish-brown friable heavy silt loam or silty clay loam. In places small areas of Collins silt loam, Vicksburg very fine sandy loam, and Waverly silt loam are included.

This is an extensive and important soil occurring on well-drained bottoms, except those of Mississippi River. The larger areas are in the valleys of Bayou Pierre, Little Bayou Pierre, Gunns Bayou, and Bakers, Willis, and Kenison Creeks. In Big Black River Valley small areas occupy higher bottom positions adjacent to uplands and terraces. A considerable proportion of the soil lies 20 or more feet above the streams in the larger bottoms and is seldom if ever overflowed. Such areas are essentially high-bottom phases of the typical soil and occur principally in Bayou Pierre Valley. These areas are not sufficiently old to have developed the thoroughly oxidized buff silty clay subsoil characteristic of the corresponding terrace soil, Lintonia silt loam.

Vicksburg silt loam occurs on a flat flood plain, sloping gently toward the streams. Most of the land is smooth, but some of the lower areas are to some extent traversed by channels of sloughs. Some areas of poorly drained bottom-land soils are included.

Surface drainage over most of the soil is good, and internal drainage is satisfactory. Where this soil is associated with the Collins and Waverly soils the subsoil may contain considerable light-gray mot-

ting and internal drainage may be sluggish. After floods subside the surplus water drains off fairly quickly. Occasionally cotton and corn crops are considerably damaged by torrential spring and summer rains, which cause the streams to overflow.

This is the best and most highly developed bottom-land soil and one of the most fertile soils in the county. About 70 per cent is in cultivation, and the soil is still producing heavily of cotton and corn without fertilization, though much of it has been farmed for many years. Uncleared areas are in bottom-land forest, consisting of oaks, hickory, gums, elm, and other trees. The grass growth in open places and pastures is strong and vigorous, consisting largely of Bermuda, carpet, Johnson, and other grasses, and Lespedeza, bur, white, and other clovers.

The largest acreage of this soil is devoted to cotton, a considerable proportion of which is long-staple varieties, such as Delfos. Yields range from one-third to 1 bale to the acre. Boll-weevil damage is serious in wet, late seasons. This is one of the best corn soils in the county, from 25 to 50 bushels an acre being obtained. Sugarcane, sorghum, cowpeas, and oats are other important field crops. Some areas are maintained as pasture for beef cattle, as the sod growth is particularly strong.

Except in the older fields cotton is rarely fertilized on this soil. Corn is never fertilized. The content of organic matter in the soil is considerably higher than in most of the upland and terrace soils. However, increasing the humus content on most fields would benefit the soil and stimulate productivity. Surface soil and subsoil are moderately acid, and lime has been applied with good results. Small levees have been built in places along the larger streams to protect the land from overflows. Locally, the construction of open ditches has improved drainage conditions materially.

This soil is probably the most valuable in the county. It commands from \$25 to \$60 an acre, depending on improvements and distance from towns and shipping points.

COLLINS VERY FINE SANDY LOAM

Collins very fine sandy loam consists of brown or grayish-brown very fine sandy loam to a depth of 10 or 15 inches, underlain by mottled gray and rust-brown or gray heavy very fine sandy loam or loam. Some included small areas are of Collins silt loam and Waverly silt loam. This soil is strongly acid in surface soil and subsoil.

This soil occurs principally near Port Gibson, in the valley of Bayou Pierre near its junction with Little Bayou Pierre. Areas are mainly flat, the surface being generally slightly billowy or smooth. Drainage is fair, but internal water movement is sluggish.

This soil is unimportant agriculturally. About 30 per cent is in cultivation to cotton or corn. Some good pastures were seen. The greater part of the soil is forested with the kind of mixed hardwood tree growth found on the Vicksburg soils.

COLLINS SILT LOAM

Collins silt loam consists of brown or grayish-brown mellow silt loam from 10 to 15 inches deep, underlain by light-brown or pale-yellow heavy silt loam or silty clay loam conspicuously mottled with

light gray, gray, or rust brown. The plowed surface appears much more noticeably grayish than in the Vicksburg soils. Some small iron concretions are in the surface soil and subsoil. Small areas of Vicksburg silt loam, Collins silty clay loam, and Waverly silt loam were included in mapping.

This soil is second in extent and importance among the bottom-land soils. It occurs in the eastern part of the county, generally in the stream bottoms, the largest areas being along Clarks Creek, Little Bayou Pierre above Pattison, Choctaw Creek, and some other streams. The soil is strongly acid.

In many places this soil borders the streams, forming broad belts of uniform bottom land. In other places it occupies the flatter positions in association with the better-drained Vicksburg soils, chiefly Vicksburg silt loam. The land is nearly flat, and the surface is prevailingly smooth. The soil is intermediate in character between the well-drained Vicksburg silt loam and the poorly drained Waverly silt loam. It is flatter than the Vicksburg soil but does not occupy such depressed or semiswampy positions as much of the Waverly soil. The line of separation between surface soil and subsoil is not distinct, as a rule, and in places the mottling comes to the surface. However, the brown color predominates in the surface soil. Drainage is fair or rather poor. Downward movement of percolating water is slow, owing to the flatness of the soil. There is, however, no very appreciable compaction or development of impenetrable layers to hinder water movement.

A rather large proportion of this soil lies 15 or 20 feet above the level of the larger streams along which it occurs. Consequently, as in Vicksburg silt loam, not all areas are reached and covered by high flood waters, though most of the soil is subject to annual inundation. After floods, the excess water flows off rather slowly, remaining ponded in lower flatter areas for some time. The soil is rather cold and late. It is productive, contains more organic matter and more readily available plant food than the upland and terrace soils, and when properly handled produces good yields. Before the advent of the boll weevil this was an important cotton soil, as early planting and quick maturity were not such important factors in the production of this crop as at present. Corn, cotton, sugarcane, sorgo, and oats are the main crops.

This is a rather important soil agriculturally, about 60 per cent being in cultivation. The remainder is in woodlands and pastures. Pastures are excellent and make the soil valuable for cattle raising. Corn yields from 20 to 40 bushels to the acre and cotton from one-fourth to one-half bale. Methods of handling this soil are similar to those used on Vicksburg silt loam. Some protection from high water has been given by levees, and some open ditches have been dug to improve drainage.

The principal undesirable attributes of this soil are its slow run-off and sluggish internal drainage. Were better drainage provided, more humus incorporated in the soil, and the acidity corrected, in part at least, higher productivity would result.

This land commands from \$15 to \$40 an acre, depending on the location and improvements.

COLLINS SILTY CLAY LOAM

Collins silty clay loam consists of brown or grayish-brown fairly mellow silty clay loam, 10 or 15 inches deep, underlain by mottled gray and rust-brown silty clay loam or silty clay, grading at a depth of about 30 inches into bluish-gray stiff silty clay or clay. Some dark-brown small iron concretions are present in places in the surface soil and subsoil, both of which are strongly acid in reaction. Small areas of Waverly silt loam and Waverly silty clay loam are included.

This soil occurs almost entirely in the Mississippi River and Big Black River bottoms, against the bluffs between Grand Gulf and McKays Ferry. The soil has apparently been deposited almost wholly by the waters of Big Black River. Areas are gently sloping or nearly flat. Most tracts adjoin swamp soils of the Waverly or Sharkey series. This soil is rather low in position and is periodically covered with flood waters. About 60 per cent of it is cultivated, mainly to corn and to a small extent to cotton. When crops are not damaged by excess water, excellent yields are obtained. Run-off is fairly good, but internal drainage is slow. The soil is very productive but, like all the bottom-land soils of the county, is subject to overflow by backwater of Mississippi River. Its value is low and its utilization for crops limited.

This soil commands from \$10 to \$20 an acre.

WAVERLY SILT LOAM

Waverly silt loam consists, to a depth of 10 or 15 inches, of mottled gray, yellow, and rust-brown silt loam, in which the gray or light-gray color predominates in the more poorly drained locations. The subsoil consists of profusely mottled gray and yellow or solid gray, light-gray, or bluish-gray silt loam or heavy silt loam, very slightly compacted or indurated. Some iron concretions are in the surface soil and subsoil, both of which are strongly acid in reaction. As mapped, small areas of associated Collins soils are included.

This soil occurs in the bottom lands of the county, except those of Mississippi River. The largest areas are in the broad bottoms of Bayou Pierre, through the central part of the county, and are mostly against the terraces or upland slopes, though in places they may reach to the stream banks. Areas are flat or depressed. The surface is nearly level and smooth. Drainage is very poor, and ponds stand over a large proportion of the soil for long periods after heavy rains or overflows. Areas are inundated frequently, as the soil occupies the lower flat first-bottom positions. The excess water drains away very slowly.

This soil is unimportant agriculturally. About 10 per cent is in cultivation. Corn and cotton are about the only crops raised. Most of the soil is forested with willow, overcup and water oaks, gum, elm, and some cypress. Wild switch cane is abundant in places. The soil is too wet and too heavily forested to allow much grass growth.

WAVERLY SILTY CLAY LOAM

Waverly silty clay loam consists of a 10 or 15 inch layer of grayish-brown or drab silty clay loam, mottled with rust brown and yellow and becoming more drab or light gray with increasing depth,

underlain without sharp textural or color change by stiff light bluish-gray silty clay loam, silty clay, or clay profusely mottled with pale yellow and rust brown. In places the lower part of the subsoil is of solid light bluish-gray color. On mounds and other slightly elevated spots and low ridges, the surface soil appears brown or light brown and during dry weather resembles the corresponding layer of the Vicksburg and Collins soils. Mottling is pronounced in both surface soil and subsoil. The reaction is strongly acid. This soil closely resembles Sharkey clay in the Mississippi River bottom in textural and color characteristics, relief, and drainage conditions, and the large area in the Big Black River bottom blends imperceptibly into the Sharkey soil in the Mississippi River bottom north of Galloway.

This soil is entirely and deeply inundated for long periods when Mississippi River and Big Black River are at high flood stage. The land, which is locally known as swamp land, is all in forest and wooded pasture. It occurs almost wholly in the Big Black River bottom, along the northern boundary of the county. Areas are mainly flat, but the uniformity of the surface is broken in many places by sloughs and shallow lakes, remnants of former stream courses. In other places, broad very flat areas are found. Drainage is poor. The value of the land depends on the stand of timber, which consists of willow and overcup oaks, gums, hickories, maple, cottonwood, and some cypress. The soil has some agricultural value as pasture for beef cattle.

SARPY VERY FINE SANDY LOAM

Sarpy very fine sandy loam consists of light-brown very fine sandy loam from 12 to 15 inches deep, underlain by light grayish-brown loamy sand or fine sand. The subsoil is characteristically coarser textured than the surface soil, but the coarser sandy stratified material occurs at variable depths. Some areas lying some distance from the river show no very noticeable difference in texture to a depth of 3 feet.

The soil is a recent river deposit in the front lands. It occurs as a natural levee formation on the banks of present or former stream channels. A long narrow area extends from Hamilton Lake to Whitehall Plantation; smaller areas are at Bruinsburg Plantation and near Harts Landing; and a strip is adjacent to the base of the Petit Gulf Hills. The last-named area has been influenced by wash from upland streams. An area of Sarpy fine sandy loam at Harts Landing was included because of its small extent.

Areas of this soil are nearly flat or gently sloping. The front lands slope away from the river bank. The surface is generally smooth or somewhat billowy. Drainage from rainfall is excellent; but as none of the Mississippi bottom-land soils are protected by levees in this county, at high stages of the river this soil is 8 or 10 feet under water. This is the most elevated and best developed of the Mississippi first-bottom soils, however, and is the first to recover from inundation.

Although neither extensive nor important agriculturally, this soil is the best suited of the Mississippi bottom lands to cultivation under prevailing conditions. About 60 per cent is in cultivation.

When given adequate levee protection, this is a very early, warm, and productive soil. It is much used for cotton in other parts of the State. Cotton and corn are practically the only crops grown on it in this county. In favorable years cotton produces from one-half to 1 bale to the acre and corn from 25 to 50 bushels.

No fertilizers are used on Sarpy very fine sandy loam. Bermuda grass forms a good sod in uncultivated open areas which, where fairly well drained, furnish good pasturage for beef cattle.

This soil commands from \$10 to \$25 an acre.

Sarpy very fine sandy loam, low phase.—The low phase differs from typical Sarpy very fine sandy loam in elevation and utilization. It consists of yellowish or grayish-brown very fine sandy loam or loamy very fine sand from 8 to 12 inches deep, underlain by light-brown or light grayish-brown very fine sand, loamy fine sand, or sand. There is considerable textural variation in both surface soil and subsoil. The soil is neutral in reaction.

The soil is not extensive. The principal areas are in the Mississippi River bottom west of Grand Gulf and south of Bruinsburg Plantation. Areas are nearly flat. The surface is rather low, ridgy, and billowy, showing much evidence of inundation by floods. Drainage from rainfall is good. This soil lies at a lower level than typical Sarpy very fine sandy loam, and is entirely forested with overcup oak, cottonwood, willow, and some gum trees. It is quickly overflowed by high water and remains covered much longer than the typical soil. It has little value except for pasture and timber production.

SARPY SILT LOAM

Sarpy silt loam consists of yellowish or grayish-brown silt loam from 12 to 15 inches deep, underlain by light grayish-brown very fine sandy loam, very fine sand, or fine sand. Both surface soil and subsoil are neutral in reaction.

The soil is inextensive, but about 80 per cent is in cultivation to cotton and corn. Areas are near Grand Gulf and on Bruinsburg Plantation. The relief is nearly flat or gently sloping. The soil lies at about the same elevation above the river as Sarpy very fine sandy loam. The surface configuration is smooth in most places. Drainage from rainfall is good, but the soil is inundated to a depth of 5 or 10 feet by the higher floods. It is a very strong and productive soil, producing from one-half to 1 bale of cotton to the acre and from 25 to 50 bushels of corn. It can not often be planted early in the season, but it drains well when flood waters have subsided.

Land values are from \$10 to \$25 an acre.

Sarpy silt loam, low phase.—Only one small area of Sarpy silt loam, low phase, located 1 mile west of Grand Gulf, was mapped. It consists of yellowish or grayish-brown silt loam or heavy silt loam from 8 to 12 inches deep, underlain by somewhat mottled light grayish-brown very fine sandy loam or very fine sand. The relief, drainage, utilization, and value are the same as of Sarpy very fine sandy loam, low phase. The soil is all in timber.

SARPY CLAY

To a depth ranging from 12 to 24 inches Sarpy clay consists of brown or grayish-brown somewhat plastic silty clay or clay, some-

what mottled with yellow and rust brown in places. This is underlain by light grayish-brown or light-brown silt loam, very fine sand, or fine sand. The surface soil and subsoil are neutral in reaction.

This soil occurs mainly near McKays Ferry and Lake Carnac, and near the mouth of Bayou Pierre. Areas are flat. The surface of the higher areas is very smooth, but in the lower wooded areas there are some inequalities of surface in the form of sloughs and slight ridges. Drainage from rainfall is fairly good, but the soil is covered with flood waters, at times to a depth of 8 to 12 feet, when the river is at moderately high stages. This soil lies at an elevation slightly below that of Sarpy very fine sandy loam and Sarpy silt loam but somewhat above that of Sharkey clay.

Sarpy clay is unimportant agriculturally. About 30 per cent is in cultivation, the acreage planted depending on seasonal flood and rainfall conditions. The soil does not dry out so rapidly after inundation as does Sarpy silt loam, but it is very strong and productive and yields heavily in favorable years. Cotton and corn are grown, cotton yielding from one-third to 1 bale or more to the acre and corn from 30 to 50 bushels. The cleared but uncultivated areas support an excellent sod of Bermuda grass and clovers. No fertilizers are used. The forest consists of overcup, post, and white oaks, elm, willow, hickory, cottonwood, and sycamore.

Land of this kind commands from \$5 to \$15 an acre.

SHARKEY CLAY

Sharkey clay, to a depth ranging from 8 to 15 inches, consists of brown or dark grayish-brown plastic silty clay or clay, conspicuously mottled with bluish gray, rust brown, and yellow. This overlies very tenacious plastic bluish-gray clay profusely mottled with yellow and rust brown. On drying the soil cracks deeply and crumbles into small cubical aggregates; hence the local name of "swamp buckshot land." Both surface soil and subsoil are neutral in reaction.

This soil is more extensive than all the other Mississippi bottom-land soils combined. It occupies a belt from one-half mile to 2 miles wide between the more elevated land of the natural levee of the river bank and the abrupt face of the upland bluffs, constituting an extensive, wooded, bottom-land swamp. It is entirely forested with overcup oak, swamp white oak, water oak, gum, cottonwood, sycamore, poplar, willow, and cypress, with, in most places, a tangle of underbrush and vines.

Drainage is very poor. The soil is covered with water during rainy periods and is soon flooded when the river begins to rise. Quiet backwaters are ponded over it for long periods in the winter and spring. The soil receives an annual deposit of clayey material from this source. During dry periods most of the surface water drains off.

Areas are flat and depressed. The surface is mainly smooth and level in large areas, but in places low ridges and many sloughs and shallow lakes mark the site of former river channels or of inflowing tributaries. Some beef cattle range over this soil, but the grass growth is thin, owing to the presence of flood waters and the dense

shade of the forest. The land is extremely fertile, but cultivation is useless without adequate levee protection and drainage.

Land of this kind is valued according to its stand of merchantable timber.

RIVER WASH

River wash includes low river bars and sandy and gravelly washes in or immediately adjacent to the larger streams of the county. It is mapped almost entirely adjacent to the channel of Mississippi River, though small areas are shown in Little Bayou Pierre Valley. These strips and areas of river wash are barren and devoid of vegetation, as most of them are traversed by swift currents of water at normal flood stages. In the areas along Mississippi River there are some included mud flats and bars which are growing up with a dense stand of willow and cottonwood saplings. The soil in such areas is dark clay, overlying stratified sand and gravel at a slight depth. The distinction between river wash and the low phases of the Sarpy soils is not sharp, but in general those soils occupy a somewhat higher position and support somewhat older trees.

SOILS

The upland soils of Claiborne County have developed from a layer of silt, usually called loess, supposed to be of wind-deposited origin. This layer is thick in the western part of the county and thin or entirely lacking in the eastern part, where in places an underlying series of sands, clays, and thin limy beds are exposed at the surface. The extreme western part of the county includes part of the great Mississippi River flood plain, when the soils consist of material deposited by that stream. Strips of similarly deposited material lie in the valleys of the other streams of the county.

The most important soil on the uplands of the county is Memphis silt loam, whose distribution is shown on the soil map accompanying this report. A description of a profile in forested localities where all the natural features are undisturbed follows. Horizon A_1 , to a depth ranging from an inch or less to 3 or 4 inches, consists of loose and friable strongly acid, smooth, dark grayish-brown silt loam containing considerable organic matter and having a tendency to break into fine soft granules. Horizon A_2 , between depths of 1 and 12 inches but in most places in cultivated fields, especially on slopes, continuing to a depth ranging from 4 to 8 inches, is friable uncompacted smooth soft finely granular light-brown silt loam showing some minute black or dark-brown specks and containing a large number of small pores and soft irregular breakage aggregates. This material is strongly acid in reaction and is uniform in all characteristics except thickness.

The next lower horizon, B_1 , in most places occurring between depths of 12 inches and 4 feet, consists of finely granular buff-colored silty clay or silty clay loam with a very few small dark specks, small visible pores, and well-developed breakage into irregular angular clods. The material is uncompacted or only very slightly compacted, is moderately plastic, strongly acid, and uniform. This horizon grades everywhere into the B_2 horizon, continuing from about 4 to

10 feet below the surface. This consists of finely granular and porous uncompacted silty clay loam, heavy silt loam, or silt loam, in which the texture becomes progressively coarser with depth and the color grades from pale buff to light yellowish brown. Cut surfaces are yellowish brown, with a few dark specks of iron oxides, and broken surfaces are blotched with alternating buff and yellowish brown. Also, along breakage planes the color is darker buff, with some light-brown or whitish silt deposit which has worked its way downward through cracks from the surface soil. This deposit also forms as a whitish crust on the face of this horizon in deep cuts. Breakage is into angular irregular clods. The material is moderately friable, and there are a few very small aggregates of iron oxides. The reaction is moderately acid, becoming less acid with increasing depth.

The parent material, horizon C, lying below a depth of about 10 feet, consists of smooth, floury, yellowish or light brownish-yellow silt or silt loam, in which cut surfaces are a shade lighter. Some very fine streaks and small spots of dark material, presumably iron-oxide stains, and small whitish streaks and spots of soft calcium carbonate are to be seen. Scattered small, white, thin snail shells are common, and some whitish lime concretions, cylindrical, tubular, but irregular in outline, are found. The mass is apparently structureless but is full of minute visible pores, more conspicuous here than in the weathered horizons above. The reaction is alkaline, but the amounts of lime present are variable. This horizon is present everywhere that the loess is 15 or more feet thick.

A very noticeable feature of the entire soil is its tendency to stand vertical or nearly vertical in bluffs or cuts. Some of these bluffs along the Mississippi River bottoms are 100 or more feet high and in places are bare of vegetation. The parent material and resultant weathered soil are devoid of any traces of stone or gravel, with the exception of a few small surface fragments of flinty rocks marking Indian encampments.

Under virgin forested conditions, Grenada silt loam has a 1 or 2 inch A_1 organic horizon of dark-gray or dark grayish-brown, smooth, friable, well-leached, strongly acid silt loam having a soft fine granular structure. This layer is more strongly developed in this soil than in the related Memphis silt loam, giving a darker tint to newly cultivated fields. Between 2 and 8 inches is the A_2 horizon of smooth brown or light-brown silt loam with vague alternating darker and lighter brown spots and a few black specks. The structure is finely granular, with some minute pores. Breakage is but faintly developed into soft, irregular clods. This horizon is friable and strongly acid in reaction. It is thin in places, owing to erosion.

The B_1 horizon of silty clay loam or silty clay, lying between depths of 8 and 24 inches, consists of uncompacted, moderately friable, strongly acid, yellowish-brown material, buff tinted and showing some small dark specks of iron oxides in some places and streaks and mottles of gray in others. The finely granular structure is well developed, and small pores are numerous; breakage is angular, irregular, and of all sizes. This layer is underlain to a depth of 4 feet by the B_2 horizon of silty clay loam or silty clay, profusely mottled, streaked, and blotched with alternating light-gray, yellow, and brown colors and some dark-brown and nearly black spots. On exposure the

black spots, which are zones of iron segregation and formation of iron concretions, become rounded concretions from one-eighth to one-fourth inch in diameter. The structure is finely granular, and minute pores are numerous. Breakage is irregular, angular, and of all sizes. There is considerable compaction or cementation of the soil grains with iron compounds into a semihardpan condition. The layer is moderately plastic when moist and hard when dry. The reaction is strongly acid. It shows considerable variation from place to place and is not sharply divided from the layer above or below.

Between depths of 4 and 8 feet, provided the loessial material extends to that depth, is yellowish-brown heavy silt loam or silt loam, very much streaked and mottled with light-gray and dark iron concretionary zones. The structure is granular and breakage angular. The material is slightly compacted, is moderately friable, and is moderately or strongly acid. It is variable as to depth and thickness in different places, but is everywhere underlain by coastal-plain sandy clays and clays.

Grenada silt loam differs from Memphis silt loam in the three following important particulars: (1) The original loess mantle of the Grenada soil has been entirely leached of its lime carbonate, as the loess deposit is much thinner; (2) compaction, that is, induration resulting from some cementation of the soil grains occurs in the lower part of the subsoil of the Grenada, but not of the Memphis soil; and (3) mottles and iron concretionary formations are found in the lower part of the subsoil of the Grenada soil but are almost entirely lacking in the Memphis. Some other differences are worthy of mention. The surface soil contains slightly more organic matter in the Grenada soil. The Grenada soils are not quite so productive as the corresponding types of the Memphis series; they are later soils, drainage and aeration are not quite so good, and the acidity is somewhat more intense in both surface soil and subsoil. The most consistent feature of the Grenada soil is the compaction of the lower part of the subsoil. Both the degree of mottling and the number of iron concretions in this layer are decidedly variable.

Lintonia silt loam, in the virgin condition, has a 1-inch or less A_1 horizon of dark grayish-brown silt loam containing some organic material. The A_2 horizon, lying between depths of 1 and 15 inches, is smooth friable light-brown silt loam, in which the cut surface shows inconspicuous streaks of light-brown coloration and small irregular areas of darker material. The material is fine, of soft granular structure, and full of minute pores. Breakage is into soft irregular clods. The reaction is moderately acid. The B_1 horizon, between depths of 15 and 36 inches, is buff silty clay which becomes brown when crushed and contains scattered small black specks and a few faint splotches of lighter brown. The structure is well developed finely granular, with minute pores; breakage is into irregular angular clods. There is no noticeable compaction. This layer is somewhat plastic, and in reaction is moderately acid. It is uniform, changing abruptly from the horizon above but grading below into horizon B_2 occurring between depths of 3 and 8 feet and consisting of silty clay loam, grading with increasing depth into buff silt loam, becoming light brown when crushed. Faint light-brown splotches and minute black specks are apparent on a cut surface. There is

a slightly granular structure and many more pores than in the heavier horizon above. Breakage is irregular and angular, and friability is good. Some slight aggregates and specks of dark-brown iron oxides were seen. The reaction is moderately acid. This is a true gradational horizon, blending with the layers above and below.

From a depth of approximately 8 feet downward is the C horizon of smooth, rather coarse, light-brown silt loam high in silt. Cut surfaces show many small dark-brown or black specks of iron oxide. The structure is finely granular, and the material is full of small pores. The reaction is moderately acid.

The soils of the bottom lands do not contain successive layers like those found in the upland soils, all of which result from weathering. Such layers as are present are the product of conditions prevailing during the deposition of the material by the river.

Of the uplands, one-half of the area is included in the rough and broken bluff region proper, of which less than 5 per cent is in cultivation. Of the rest of the upland, very nearly 60 per cent is in cultivation. Of the stream bottoms, aside from those of Mississippi River, about 40 per cent is cultivated. Very little of the extensive bottoms of Big Black River is cultivated, but the proportion of cultivated land on the remainder of the bottoms is much larger. Less than 15 per cent of the Mississippi bottoms is cultivated. Nearly 90 per cent of the terraces is cropped.

Most of the agricultural development of the county has taken place on the undulating and rolling uplands, the terraces, and the better-drained bottom lands. The least development is in the bluff region and in the swampy bottoms.

There is a sharp delineation between soils of the county testing acid in reaction and soils testing neutral. All the upland, terrace, and bottom soils, other than those of the Mississippi bottoms, are moderately or strongly acid in both surface soil and subsoil. This group constitutes nine-tenths of the area of the county. All the soils of the Mississippi bottoms are neutral or very slightly acid in surface soil and subsoil.

The entire upland area of the county was at one time occupied by silt loam soils. Of the cultivable uplands very nearly 75 per cent has a silt loam surface soil from 6 to 12 inches thick. Weathering and erosion are responsible for the development and exposure, respectively, of the heavier silty clay loams and silty clays, which are of subsoil character and which now constitute the surface soil of 25 per cent of the cultivable uplands. The clayey soils occur largely in the eastern part of the county.

Nearly all the terrace soils are of silt loam texture. There is scarcely any terrace development in Mississippi River Valley in the county, the terraces being found in the valleys of larger tributary streams.

Of the stream bottom lands, aside from those of Mississippi River, about 10 per cent are of fine sandy texture, 75 per cent of silty texture, and 15 per cent of clayey texture.

In the Mississippi River bottom, not considering river wash which is largely sand, coarse sand, and gravel, 25 per cent of the soils are of fine sandy texture, 5 per cent of silty texture, and 70 per cent of clay.

There are no poorly drained upland soils in the county, in the sense of restricted regional drainage or sluggish run-off, and no upland swamps, soggy flats of appreciable size, or natural ponds or lakes. Relief is ample and the number of drainage ways sufficient to provide rapid run-off of surplus rainfall. Of the terrace soils, 75 per cent have well-established drainage, 20 per cent fairly good drainage, and 5 per cent poor drainage. The bottom lands, other than those of Mississippi River, have good drainage in 50 per cent of their area, fairly well-established drainage in 25 per cent, and poor drainage in 25 per cent. The larger part of the swampy bottom lands occurs in the Big Black River bottoms. On the Mississippi River bottoms, not considering river wash, 15 per cent of the land is well drained, 25 per cent fairly well drained, and 60 per cent poorly drained swamp land. The excessively high flood stages occasionally reached in recent years have caused agricultural operations to be confined to the highest-elevated and best-drained parts of the Mississippi bottoms.

The study of the soils of the county indicates that under existing conditions very nearly one-half of the land may be considered agricultural and the rest best suited to forestry and grazing. Allowing for the many inclusions of small areas of steep slopes in the upland tillable soils, as mapped, the indications are that the acreage of agricultural land is but little larger than the acreage now cultivated. In other words, Claiborne County does not offer large areas of woodlands suitable for clearing and cultivation at the present time, aside from lands which may be reclaimed by extensive levee construction and artificial drainage.

SUMMARY

Claiborne County is in southwestern Mississippi. Big Black and Mississippi Rivers form the northern and western boundaries. The land area of the county is 477 square miles, or 305,280 acres.

The population in 1920 was 13,019, all of which is classed as rural, and of which 73.7 per cent is colored and 26.3 white. Port Gibson is the county seat and largest town.

Two-thirds of Claiborne County is upland. Nearly one-half the upland area is rough and broken country of the Mississippi bluff region or cane-hill belt, which borders the river bottoms. The remainder of the upland is undulating or rolling, with some hillier areas.

Drainage of the uplands and nearly all of the terrace areas is good. There are also large well-drained areas of bottom land, although in the Mississippi bottoms most of the land is poorly drained and deeply inundated during high flood stages of the river, owing in part to lack of levee protection on the Claiborne County side of the river at this point.

The Yazoo & Mississippi Valley Railroad and a branch line provide good railroad transportation. The main highways are graveled and well maintained.

Port Gibson is the principal home market. Cotton is sold at the various towns in the county. The markets for livestock are St.

Louis, Vicksburg, and New Orleans. The climate of Claiborne County is of the mild temperate humid type. The growing season for tender vegetables is 223 days at Port Gibson but is 240 or more days for most of the county.

In Claiborne County cotton growing has been the principal agricultural activity continuously since before the Civil War. In recent years yields have dropped far below former levels. There has been an egress of about two-fifths of the population, chiefly colored laborers, since 1910, or since the effects of the boll weevil on the cotton crop began to be severely felt. Previous to that date little land was devoted to crops other than cotton and corn, but since then the acreage of all other crops has increased until it is now approximately equal to that planted to corn or to cotton.

The present agriculture of the county consists of growing cotton as the main cash crop, with corn the chief subsistence crop, and oats, Bermuda grass, Lespedeza, bur clover, and cowpeas and other legumes for hay and forage crops. The production of early tomatoes for shipment to northern markets is receiving some attention. The numbers of beef cattle, dairy cattle, and hogs are increasing. The livestock is raised in the rough and broken upland areas, in the poorly drained bottom lands, and on farms where diversification is practiced.

No systematic crop rotations are followed. Cotton is occasionally alternated with corn. The use of commercial fertilizers is becoming general, especially for cotton.

The average size of farms is 113.5 acres. Land holdings of 1,000 or more acres are common in the western part of the county, but in the eastern part more of the old plantations have been divided. About 78 per cent of the area of the county is in farms, of which 46.4 per cent is classed as improved farm land. About 74 per cent of the farms of the county are operated by tenants. Land values range from \$5 to \$60 an acre.

The upland soils belong to the Memphis and Grenada series; the terrace soils to the Lintonia, Olivier, and Calhoun series; and the bottom-land soils to the Vicksburg, Collins, Waverly, Sarpy, and Sharkey series. In addition, river wash is stream-bottom material.

The agricultural outlook of the county is promising. Most of the soils have good inherent strength and productive capacity, are tolerant of abuse, and may be returned to and maintained in a high state of productiveness by good soil management. Soil improvement may be accomplished by using suitable rotations, applying some fertilizer, growing numerous leguminous crops, terracing sloping fields, and using improved machinery and methods.

This is a particularly good grazing section. The long growing season allows the production of a great variety of farm crops. Expensive buildings for housing livestock are unnecessary. Ample forage and feed crops may be grown easily. The county is declared free of the fever tick.

A great number of different field, orchard, and truck crops may be grown, making diversification a matter of adopting a cropping sys-

tem suitable to soil, type of farming, and market demands. Land values are comparatively low.

Transportation facilities, educational advantages, and living conditions are good. Too much land, undoubtedly, still remains in large holdings for the good of the county. Tenancy is proportionately large, and the quality of the labor is poor. With the gradual division of the old plantations and more intelligent and extensive cultivation of the land, healthy agricultural progress is in sight for the future. The county offers many advantages to the incoming settler.



[PUBLIC RESOLUTION—No 9]

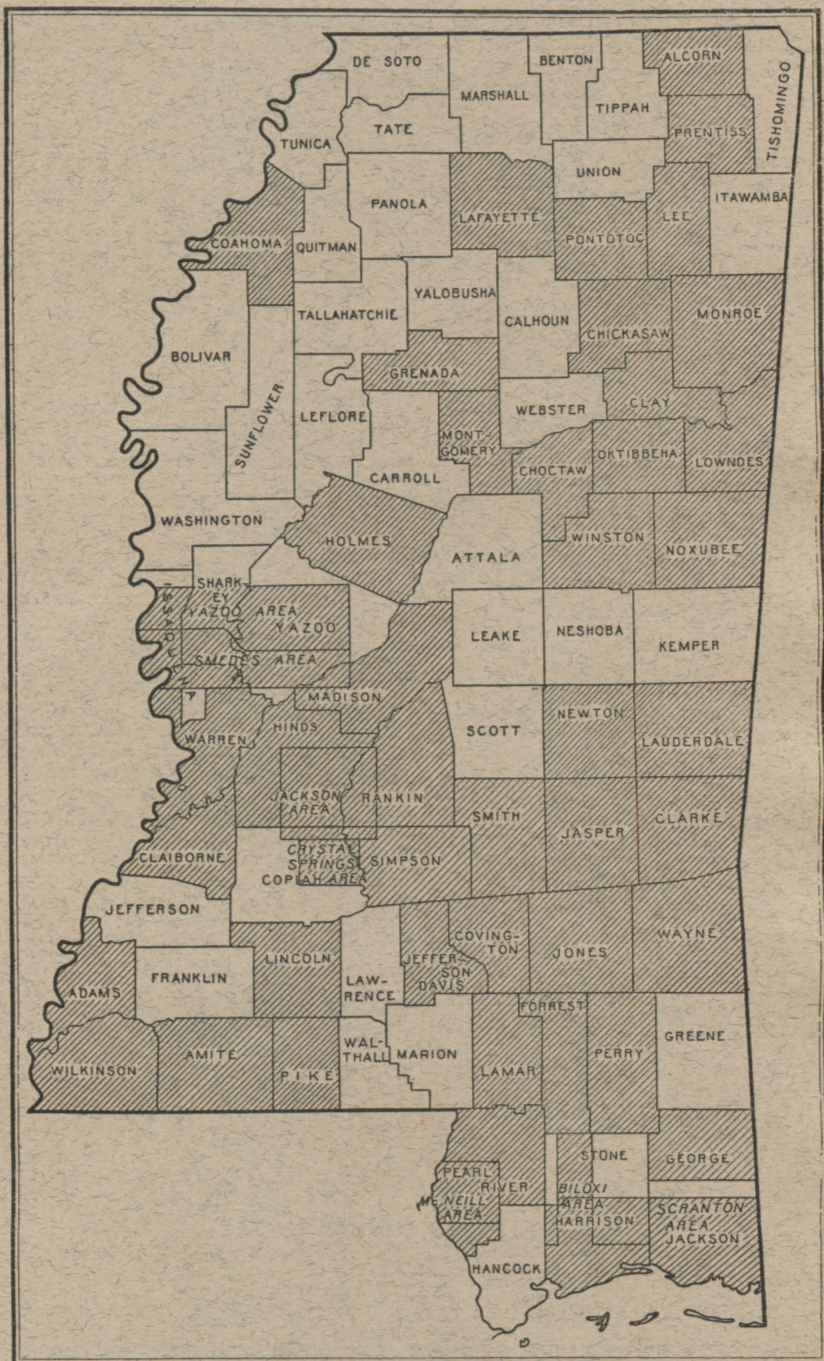
JOINT RESOLUTION Amending public resolution numbered eight, Fifty-sixth Congress, second session, approved February twenty-third, nineteen hundred and one, "providing for the printing annually of the report on field operations of the Division of Soils, Department of Agriculture."

Resolved by the Senate and House of Representatives of the United States of America in Congress assembled, That public resolution numbered eight, Fifty-sixth Congress, second session, approved February twenty-third, nineteen hundred and one, be amended by striking out all after the resolving clause and inserting in lieu thereof the following:

That there shall be printed ten thousand five hundred copies of the report on field operations of the Division of Soils, Department of Agriculture, of which one thousand five hundred copies shall be for the use of the Senate, three thousand copies for the use of the House of Representatives, and six thousand copies for the use of the Department of Agriculture: *Provided*, That in addition to the number of copies above provided for there shall be printed, as soon as the manuscript can be prepared, with the necessary maps and illustrations to accompany it, a report on each area surveyed, in the form of advance sheets, bound in paper covers, of which five hundred copies shall be for the use of each Senator from the State, two thousand copies for the use of each Representative for the congressional district or districts in which the survey is made, and one thousand copies for the use of the Department of Agriculture.

Approved, March 14, 1904.

[On July 1, 1901, the Division of Soils was reorganized as the Bureau of Soils, and on July 1, 1927, the Bureau of Soils became a unit of the Bureau of Chemistry and Soils.]



Areas surveyed in Mississippi, shown by shading

