U. S. DEPARTMENT OF AGRICULTURE,
BUREAU OF SOILS—MILTON WHITNEY, Chief.

SOIL SURVEY OF FAULKNER COUNTY, ARKANSAS.

BY

E. B. DEETER, IN CHARGE, AND HENRY I. COHN.

HUGH H. BENNETT, INSPECTOR, SOUTHERN DIVISION.

[Advance Sheets—Field Operations of the Bureau of Soils, 1917.]

WASHINGTON:
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1919.

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LETTER OF TRANSMITTAL

U. S. DEPARTMENT OF AGRICULTURE,
BUREAU OF SOILS,
Washington, D. C., May 20, 1918.

SIR: I have the honor to transmit herewith the manuscript report and map covering the survey of Faulkner County, Ark., and to request that they be published as advance sheets of the Field Operations of the Bureau of Soils, 1917, as authorized by law.

Respectfully,

MILTON WHITNEY,
Chief of Bureau.

Hon. D. F. HOUSTON,
Secretary of Agriculture.

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SOIL SURVEY OF FAULKNER COUNTY, ARKANSAS.

By E. B. DEETER, In Charge, and HENRY I. COHN.—Area Inspected by HUGH H. BENNETT.

DESCRIPTION OF THE AREA.

Faulkner County, Ark., is situated slightly north of the geographical center of the State. It is bounded on the north by Van Buren and Cleburne Counties; on the east by White, Lonoke, and Pulaski Counties; and on the south by Pulaski County. On the west it is separated from Perry County by the Arkansas River and from Conway County, for the greater part, by Cadron Creek. Conway, the county seat, is 31 miles northwest of Little Rock, the State capital. The greatest length of the county, north and south, is about 33 miles, and the greatest width about 24 miles. It has a total area of 651 square miles, or 416,640 acres.

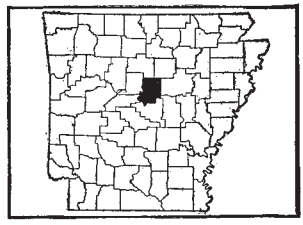

FIG. 1.—Sketch map showing location of the Faulkner County area, Arkansas.

Faulkner County lies entirely within the Ouachita Mountain belt, comprising lowlands, ridges, and plateaus whose elevations are lower than those of the higher part of the Boston Mountain country to the north. The northern fourth differs essentially from the rest of the county in topography. It includes a series of well-defined, somewhat isolated plateaus, with intervening lowland areas. The tops of these plateaus are comparatively level. The descent from plateau to lowland is generally steep, but in some instances the slopes are gentle. Some of the more prominent of these plateaus are Becket Mountain and Batesville Mountain. They range in elevation from 650 to 750 feet above sea level.

South of this region the county consists of alternating ridges and lowland belts. Their general trend is east and west, except in those places where they assume other directions in curving from an easterly direction back to a westerly one. The width of the ridges at their bases is generally less than a quarter of a mile. With some important exceptions, as near Mount Meto School, the crests are only a few yards wide. The height above the adjacent lowland varies

from a few feet to 250 feet, with a maximum elevation of about 850 feet above sea level. In some regions there are only a few and in other places numerous gaps. The northern slopes are in most places gentle and only moderately stony, while the southern slopes are usually steep and rough. A prominent exception to this ridge topography is Round Mountain, a flat-topped plateau south of Conway. One of the most prominent examples of alternating ridge and narrow-valley topography occurs in a belt, averaging 2½ miles wide, which begins at Cadron Creek on the west and extends eastward into White County. The southern edge of this belt lies about 1 mile north of the towns of Conway and Vilonia. North and northwest of Mayflower about 2 miles south of Conway there is another extensive system of ridges and relatively narrow valleys. Another ridge area occurs in the southeastern part of the county, reaching eastward from the road between Saltillo and Chadwick to the county line. On this ridge the maximum elevation is about 850 feet.

In the northern or plateau part of the county the streams are swift flowing and have not yet cut their channels to base level, although the North and East Forks of Cadron Creek in places are intrenched to depths of 75 to 100 feet below the upland surface. The slopes to the large streams vary from steep to precipitous, and there are only relatively small, isolated strips of bottom land. The county is thoroughly ramified by drainage courses, which in many cases have cut deep gullies and ravines through the underlying rocks. Important tributaries of the North and East Forks of Cadron Creek are Cove Creek, Mill Creek, and Clear Creek.

As the streams emerge from the plateau region in the northern part of the county and flow southward toward the Arkansas River, they become more sluggish, apparently having cut their channels almost to base level. An important characteristic of the drainage ways in the southern part of the county is the development of relatively wide bottoms. In the narrow valleys of the folded areas previously described, however, the streams generally flow swiftly until they enter the larger valleys. The principal streams in the southern part of the county are Cadron Creek, Palarm Bayou, Tupelo Bayou, Muddy Bayou, and Cypress Creek. The valleys drained by these streams vary from 1 to 5 miles or more in width, and comprise important farming lands. All the drainage waters of the county eventually reach the Arkansas River, along which stream there are developed the most fertile soils in the county.

Faulkner County was formed in 1873, from parts of Conway and Pulaski Counties. Most of the early settlers came from the Southeastern States, particularly the Carolinas, Georgia, Alabama, Mississippi, and Tennessee, and the present population consists mainly of descendants of the early settlers, although in the vicinity of Conway

there are a number of German farmers. About 19 per cent of the population is negro. Most of these live near the Arkansas River. In the census of 1910, the population of the county is reported as 23,708, of which 88.2 per cent is classed as rural.

The population of the county is fairly well distributed, although there is very little settlement northwest of Mayflower and in the mountainous area northeast of Chadwick.

Conway, the county seat, has an estimated population of nearly 5,000. It is one of the best cotton markets in the State, and an important trading point. The State Normal School, Hendrix College, and Central College are situated here. Greenbrier, Mount Vernon, Vilonia, Enola, Wooster, Guy, Holland, Martinville, Damascus, Cato, and Naylor are towns of local importance. Transportation is furnished by the St. Louis, Iron Mountain & Southern Railway, connecting Little Rock and Fort Smith. This road traverses the southwestern part of the county and passes through Conway.

During the winter months many of the wagon roads are in bad condition; at other seasons they are in general good. Some interest is being taken in road improvement in some parts of the county, and several surveys have been made for improved highways. The rural districts are reached by telephone lines and rural mail routes extend to all parts of the county.

CLIMATE.

Although there are no elevations in Faulkner County so great as those of the Boston Mountain region to the north, the differences in elevation between the crests of ridges or the tops of plateaus and the valleys are sufficient to cause noticeable differences in climatic conditions. The temperature and precipitation data given in the table below are based on observations at Conway, which has an elevation, according to the United States Coast and Geodetic Survey, of 320 feet above sea level, while the maximum elevations in the county are about 850 feet. The difference in mean annual temperature between the valleys and the ridges and plateaus is about 2° F. The buds of fruit trees appear later in the spring on the higher elevations than in the valleys. Crops mature somewhat later in the lowlands than in the higher country. The mean annual temperature is about 61° F. There are seldom any prolonged periods of extreme heat or cold. In some winters there is only slight snowfall, but during the progress of the present survey there were four or five snowfalls, some of which were 6 to 8 inches in depth.

The mean annual precipitation is reported at Conway as 46.72 inches. It is fairly well distributed through the year. Occasionally there is a drought during the growing season, or a period of un-

usually heavy rainfall. The months of lightest rainfall are August, September, and October.

The average date of the last killing frost in the spring is March 28, and that of the first in the fall November 2. The earliest killing frost recorded in the fall occurred October 11, and the latest in the spring April 12. The average length of the growing season is thus 218 days. Two crops of certain kinds, such as potatoes, can be grown in one year. Small grain may be followed by cowpeas or soy beans for hay.

The following table is compiled from the records of the Weather Bureau station at Conway:

Normal monthly, seasonal, and annual temperature and precipitation at Conway.

Month.	Temperature.			Precipitation.		
	Mean.	Absolute maximum.	Absolute minimum.	Mean.	Total amount for the driest year (1885).	Total amount for the wettest year (1890).
	°F.	°F.	°F.	*Inches.*	*Inches.*	*Inches.*
December	42.4	77	5	3.90	2.25	2.63
January	39.2	80	− 2	4.04	2.71	6.13
February	42.0	83	−15	4.04	2.25	11.08
Winter	41.2	83	−15	11.98	7.21	19.84
March	52.2	92	11	4.80	2.18	10.46
April	62.3	96	29	3.75	5.28	12.18
May	69.6	98	33	5.37	2.62	6.50
Spring	61.4	98	11	13.92	10.08	29.14
June	76.8	106	49	4.00	2.08	3.81
July	80.4	111	52	3.57	0.70	3.34
August	79.2	112	52	3.25	0.90	3.98
Summer	78.8	112	49	10.82	3.68	11.13
September	73.3	109	36	3.56	3.25	10.31
October	61.1	101	24	2.17	0.49	2.57
November	49.9	85	14	4.27	2.09	4.71
Fall	61.4	109	14	10.00	5.83	17.59
Year	60.7	112	−15	46.72	26.80	77.70

AGRICULTURE.

The type of agriculture in Faulkner County has undergone few important changes from its inception to the present time. In the early days when the means of communication and transportation were still largely undeveloped, special effort was made to provide all the necessary food crops for subsisting the population and live stock,

but the production of cotton, and of a surplus of corn and wheat for sale was undertaken soon after agriculture had become established.

On the other hand, while the type of farming has not shown marked change, the extension of the industry has been both marked and rapid, especially since 1880. This can be measured by the increase in number of farms and in the proportion of farm lands improved, the former rising from 1,786 in 1880 to 4,091 in 1910, and the latter from only 25.4 per cent to 51.1 per cent. The total land in farms increased during the same three decades from 211,284 acres to about 300,000 acres. It is believed that very considerable increases have been experienced since the last census. The very material growth of agriculture is also reflected in acreage and production of crops, data for the five most important being tabulated below:

Acreage and production of certain crops.

Year.	Corn.		Wheat.		Oats.		Cotton.		Hay.[1]	
	Acres.	Bushels.	Acres.	Bushels.	Acres.	Bushels.	Acres.	Bales.	Acres.	Tons.
1879	19,647	347,062	3,300	18,197	2,793	39,247	15,749	8,692	290	268
1889	29,387	556,324	933	5,054	5,502	69,808	34,381	12,141	683	760
1899	41,055	616,310	10,639	43,310	9,805	108,960	33,338	12,195	[1] 2,292	2,699
1909	43,236	581,661	114	589	4,824	56,928	49,163	14,925	[1] 6,725	7,301

[1] Including all tame or cultivated grasses, wild grasses, and coarse forage.

The salient facts brought out by this table are: (1) An increase in the total area occupied by the five crops, from 41,779 acres in 1879 to 104,062 acres in 1909, the acreage of each of the leading crops, cotton and corn, in the latter year exceeding the combined acreage in 1879; (2) the large and regular increase in the acreage of cotton and corn; (3) the disproportionate increase in the production of cotton, when compared with acreage, a discrepancy which is too large to be ascribed wholly to seasonal variation; (4) the erratic fluctuation of wheat acreage; and (5) the considerable increase in the acreage of hay and coarse forage crops.

At the present time the chief crops grown are cotton and corn, the acreage devoted to these two crops far exceeding that of all others. Cotton is depended upon almost entirely as a source of income. That cotton has continued to increase since the 1910 census is shown by the returns of ginners for 1916, which place the number of bales ginned in Faulkner County at 20,000. Corn, notwithstanding its large acreage, is grown almost exclusively as a subsistence crop, both for domestic use and for feeding farm animals. According to the census, the total area in cotton in 1909 was 49,163 acres and the production 14,925 bales, the average being nearly one-

third bale per acre; while in 1879, 15,749 acres produced 8,692 bales of cotton, or over one-half bale per acre.

The census reports the total value of all agricultural products in Faulkner County, in 1909, is $2,631,937. Of this amount, live stock and products were valued at $563,816. The number of live stock shipped from the county is relatively small. Cattle and hogs are raised in increasing numbers and an effort is being made to improve the breeds. Dairying has not been developed to any important extent. Dipping vats have been constructed in all parts of the county to combat the Texas-fever tick. Milch cows and beef cattle are for the most part grades, the former mainly of Jersey and Holstein and the latter of Durham and Hereford crosses on native stock. The 1910 census reports 7,154 milch cows, 8,559 other cattle, 20,211 hogs, and 2,590 sheep in the county. Herds of goats are scattered over the county, being allowed the range of waste and forest areas. Chickens and some turkeys, geese, and ducks are raised on most of the farms and on many there is a surplus for sale. The raising of poultry, however, is not engaged in to any great extent as a special industry. Cholera has caused losses among hogs in the past, but vaccination against cholera is becoming general.

Hay and forage crops have continued to increase in importance since 1909. Prairie grass, oats, cowpeas, Bermuda grass, alfalfa, sorghum, and lespedeza are commonly cut for hay. Small acreages of millet, Sudan grass, redtop, timothy, various clovers, soy beans, and Kafir corn also are grown.

Vegetables, peaches, apples, plums, pears, strawberries, and grapes are grown for home use, and a small surplus frequently is sold locally. Irish and sweet potatoes, peanuts, cowpeas, and sorghum for sirup are grown in the same way. None of these crops, except peaches and apples to a small extent, has become a specialty. The Nancy Hall is the most common variety of sweet potato, and the Red Triumph, and to a smaller extent the White Triumph, Blue Victor, and Irish Cobbler are popular varieties of Irish potato.

The marked difference in the surface features of the county have a direct influence upon the selection of farm lands. The slopes and mountain ridges, because of their rough character and susceptibility to erosion, are left in forest and are generally used only for grazing. In the northern part of the county the comparatively level tops of the plateaus and the narrow valleys constitute the most desirable farming areas, while in the southern part the bottom lands and the relatively wide valleys adjacent to them are most desirable for crop production. In the belts of alternating ridges and narrow valleys, the strips of comparatively smooth valley land are in cultivation, and where the crests of some of the ridges are wide enough, a few orchards have been planted and some general farming is done.

On most of the farms little attention is paid to crop rotation, cotton and corn being grown almost continuously. In some instances small fields of wheat or oats are grown, and occasionally cowpeas are used to build up the land.

Some recognition is given to the adaptation of certain soils to certain crops. Probably the most noticeable instance is the growing of alfalfa on the fertile bottom soils of the Arkansas River, which are known to contain considerable lime. Although home orchards have been planted in low places where they are subject to frost injury, many plantings are made on high situations where air drainage is good. Many of the poorly drained valley areas and frequently overflowed bottoms are used for hay production and pasture. The fertile Arkansas River bottoms and other stream bottoms are highly esteemed for the growing of cotton and corn.

On many farms not enough corn and hay is produced for home use, and the income from cotton is used to buy these necessities. Winter cover crops are grown only to a very small extent; in many cases they would be beneficial in checking erosion. Some farmers conserve the manure and apply it to the fields before planting in the spring. The use of commercial fertilizers has increased very rapidly during the last few years. Some of the mixtures used consist of acid phosphate and cottonseed meal; others are complete fertilizers, relatively high in phosphoric acid but low in nitrogen and potash. Some farmers apply acid phosphate alone. The use of green manures, which tend to decrease the need for nitrogen in commercial fertilizer, has not become general.

As cotton, the chief money crop, is sold soon after it is harvested, and only enough storage room for stock is required, the barns are usually small The number of substantial farmhouses and good barns is, however, increasing. During the past season of high-priced cotton (1916), the purchase of farm machinery was greatly stimulated. the one-horse plow is still used on many farms, but heavier plows are now employed throughout the county. Under the present system of farming, most of the work stock, both horses and mules, are of light weight.

In preparing land for cotton it is usually plowed in January or February. Very little fall plowing is done. Most of the land is plowed directly into beds, but some land is broken flat, harrowed thoroughly, and then bedded. Commercial fertilizer, at the rate of 100 to 150 pounds per acre, is drilled into the bed, which is then harrowed or smoothed before the seed is planted. Most of the planting on the upland soils takes place in April. Methods of cultivation vary to some extent. When the cotton is up it is sometimes top-harrowed lightly, or a scraper is used to keep down weeds.

After hoeing, or "chopping," the plants are cultivated chiefly with shallow-running implements, such as shovels, sweeps, or harrows.

Among the more important varieties of cotton grown are the Rowden, Triumph, Express, Lone Star, Green Seed, and Half-and-Half. In most instances little attention is paid to the selection of seed. According to experiments conducted by the Arkansas experiment station, the three best varieties for Faulkner County are the Floradora, Cleveland, and Webber No. 49.

Seed corn usually is selected from the supply stored in the crib. The Silver Mine, Hickory King, and Early June are popular varieties. Where corn is to be planted, the land is broken comparatively deep and harrowed. An 8-inch shovel plow commonly is used to make a slightly elevated bed, upon which the seed is planted. When about 3 inches high the corn is harrowed with a steel-tooth harrow, sometimes working both sides of the row at the same time. This operation is sometimes repeated, depending upon the rainfall, and it is followed by the use of a side harrow. After the corn has made considerable growth and has formed an extensive root system cultivation is shallow. Sometimes when the crop is laid by a turning plow is used to throw the soil up to the plants. Cowpeas frequently are drilled between the corn rows when the rows are 5 or 6 feet apart, or with narrower spacing the peas may be sown broadcast at the last cultivation.

Most of the laborers employed on the upland farms are whites, though a few negroes also are used in this part of the county. Where labor is hired by the month the wage ranges from $15 to $20, with board. Day labor commands about $1 a day. In the Arkansas River bottoms negro labor is widely employed. Cotton pickers are paid on an average of 75 cents per hundred pounds of seed cotton.

The average size of the farms in Faulkner County is given by the census as 73.2 acres, but the average holding is greater than this, as each tenancy is counted a "farm." There are some small farms of 40 acres or less and a number of large plantations along the Arkansas River. In this section there are two, each of which embraces about 3,000 acres.

The 1880 census reports 78.1 per cent of the farms operated by their owners. By 1910 the percentage had decreased to 55.3, the remainder of the farms being operated by tenants on a share-crop basis, or, to a less extent, for cash rent. Under the system of share cropping most commonly practiced the landlord receives one-third the corn and one-fourth the cotton, the tenant furnishing the work stock, implements, etc. Where the owner furnishes the work stock and implements the crops are equally divided. Bottom lands command an annual cash rental of $6 to $9 an acre.

The ordinary selling price for the upland farm lands ranges from $10 to $25 an acre, being somewhat higher in the vicinity of towns.

Good bottom land sells for $20 to $50 an acre, while poorly drained bottom land subject to overflow can be bought for $10 to $15 an acre. The better land in the Arkansas River bottom is held at $75 to $100 an acre.

SOILS.

The upland soils of Faulkner County are included in the Appalachian Mountain province, here represented under the general name of the Ouachita Mountains. The rocks of the area consist of sandstone interstratified in places with shale. The sediments entering into the formation of these two classes of rocks were deposited originally in horizontal layers in water during the Pennsylvanian period of the Carboniferous. In the northern or plateau portion of the county the underlying rocks remain in a horizontal position; in the southern part the strata have been thrown out of horizontal position or folded by movements in the earth's surface. The rocks have been acted upon by weathering and eroding agencies, the former breaking them down and the latter washing the resulting material away.

The geological processes affecting the rocks of the county have had a direct influence upon the soils. All the upland soils are of residual origin, being composed of materials derived directly from and related to the underlying rocks. The soils of the so-called valleys, with the exception of the stream bottoms, are classed as upland soils, and are residual. The immediate stream bottoms are alluvial.

On the northern plateaus, where no great geological disturbances have occurred, the shales underlying the sandstones have not been exposed, and as a result the soil is principally a gravelly fine sandy loam or a fine sandy loam. The parent sandstones vary in color from gray, buff, or yellow to reddish brown or brown, and in texture from coarse grained to very fine grained and compact. In this northern region the slopes to the valleys usually are steep, and are occupied by loams or are classed as rough stony land. The inextensive valley areas comprise soils resembling those of the larger valleys in the southern part of the county.

In the larger valleys of the southern part of the county the sandstone rocks have been eroded to such an extent that the underlying shales are exposed over large areas, giving rise to the silt loam of the Conway series and, on the higher situations and slopes, to the loam of the Hanceville series. The tops and slopes of the ridges have a very low agricultural value, owing to the abundance of rock fragments and in many cases to the steepness of the slope, and are generally classed as Rough stony land.

Aside from the areas of Rough stony land, the upland soils of the county are correlated with the Hanceville and Conway series. The Hanceville series comprises light-brown to reddish-brown surface soils and red, moderately friable subsoils. The topography

ranges from rolling to steeply rolling. These soils are derived from sandstones and shales which in places appear to be higher in iron-bearing minerals than the rocks giving rise to the Dekalb soils, which are extensive in that part of the Appalachian province lying east of the Mississippi River.

The Conway series includes the typical valley soils of the county. The surface soils of the types in this series are yellow, and the subsoils yellowish to gray. Iron concretions occur throughout the 3-foot section. In places a ferruginous hardpan is developed in the subsoil. Low, dome-shaped mounds are common, but in general the surface varies from gently rolling to flat. Drainage is poorly established, water frequently standing on the surface for long periods after rains, and the water table usually is near the surface. The Conway soils appear to be derived from shales, although they are developed near streams and in some places have the appearance of terrace soils.

The alluvial, or stream-bottom soils of the county have been formed by the deposition of sediments washed from two distinct sources. The large creeks and smaller streams have transported material derived from the soils of the adjacent valleys, hills, and mountains, and the resulting soils are classed with the Pope and Atkins series, which differ chiefly in color, as a result of the state of drainage.

The Pope series is characterized by brown surface soils and light-brown subsoils. These soils consist of alluvial material washed entirely or very largely from sandstone and shale soils and related sedimentary-rock soils of the Appalachian Mountain province. They do not carry wash from limestone formations, or at least have not been influenced by calcareous material to any important degree.

The Atkins soils are characterized by the gray color of the surface material and by the compact, dense structure and the gray or drab or mottled grayish, yellowish, and drab color of the subsoils. They are subject to flooding and are poorly drained between overflows. The material consists entirely or very largely of wash from sandstone and shale or related sedimentary-rock material of the Appalachian soil province. The Atkins series is the gray equivalent of the Pope.

The other source of the sediments forming the alluvial soils of the county is the Arkansas River. Much of the material deposited by this river in Faulkner County has been derived from the Permian Red Beds of the residual prairies of western Oklahoma, and the resulting soils have a characteristic chocolate-brown or chocolate-red color.

Members of three series, the Portland, Yahola, and Miller, comprise the first-bottom soils formed by the Arkansas River. The

Portland soils occupy a large proportion of the bottoms. This series is characterized by the brown color of the surface soils and by the salmon-red or light pinkish red to mottled grayish and chocolate-reddish color of the subsoil. The material is alluvial in origin, and contains some reddish material derived from the Red Beds region. A considerable part of it is from other sources, but there is enough of the red material present to give a distinctive color to the subsoil.

The Yahola soils are distinguished by the chocolate-red color of the surface material and by the lighter color and lighter texture of the subsoil. They are confined to the overflowed stream bottoms. The reddish color of the material is due to the presence of sediment from the Permian Red Beds region. The Yahola soils in the surface section are very similar to the Miller, having about the same color and structure, but they differ considerably from the Miller series in the subsoil, both in being lighter textured, usually sandy, and in having a lighter color, generally light chocolate red to almost gray.

The Miller series includes surface soils of chocolate-brown to chocolate-red color, with chocolate-red or pinkish-red subsoils. The soils of this series contain sufficient material brought down from the Permian Red Beds region to give them their characteristic reddish color. The drainage in general is good.

Only one terrace, or second-bottom type, the Muskogee silt loam, is mapped. It occurs along the Arkansas River. The Muskogee series is characterized by the gray to grayish-brown color of the surface soils, the yellowish color and friable structure of the somewhat heavier subsurface stratum, and by the yellow or mottled yellow and gray color and plastic structure of the heavy clay subsoil. The Muskogee types consist of material washed largely from residual prairie soils. The surface is level and drainage is poor.

The table below gives the name and the actual and relative extent of each soil mapped in Faulkner County:

Areas of different soils.

Soil.	Acres.	Per cent.	Soil.	Acres.	Per cent.
Conway silt loam	125,504	30.1	Yahola very fine sandy loam	4,672	1.1
Hanceville gravelly fine sandy loam	74,816	18.0	Muskogee silt loam	4,224	1.0
Hanceville loam	72,448	17.4	Portland very fine sandy loam	2,048	.5
Hanceville stony loam	54,336	13.0	Miller silty clay loam	1,856	.4
Hanceville fine sandy loam	22,080	5.3	Hanceville shale loam	1,472	.4
Rough stony land	12,096	2.9	Miller clay	1,152	.3
Portland clay	9,984	2.4	Portland silt loam	768	.2
Atkins clay	9,984	2.4	Riverwash	128	.1
Atkins silty clay loam	6,720	1.6			
Pope silt loam	6,336	1.5	Total	416,640	
Pope fine sandy loam	6,016	1.4			

HANCEVILLE STONY LOAM.

The Hanceville stony loam consists of light-brown to reddish-brown, light-textured loam, underlain at 8 to 12 inches by red to reddish-yellow, friable clay. Large and small fragments of sandstone and in places shale chips are scattered over the surface, and the bedrock, commonly reached at 15 to 36 inches, outcrops here and there. Much of the type as mapped consists of stony fine sandy loam or stony very fine sandy loam. The material is residual from sandstone and shale.

This type occurs in all parts of the county, occupying ridges, hills, and slopes. It characteristically has a steep surface. In the northern part of the county there are a few large areas lying chiefly on long and relatively narrow slopes of plateaus and along drainage ways. In the southern part the normal situation of the type is on the slopes and narrow crests of the numerous parallel ridges. Large areas of this character occur north of the towns of Conway and Vilonia, in the ridges grouped about Round Mountain, and southeast of Saltillo. Almost without exception the northern slopes of these ridges are more gentle and have a smaller quantity of rock fragments than the southern slopes, many of which are mapped as Rough stony land. Throughout the type there are numerous deep gullies occupied by small, swift streams.

At present practically all this land is forested with blackjack oak, red oak, post oak, hickory, and in places shortleaf pine. Large areas have been cut over. Most of the areas under cultivation are small patches or narrow strips lying at the foot of steep stony slopes. On some of the smoother slopes small clearings have been made and the larger rocks collected into piles. Cotton, corn, fruit, and garden vegetables are grown on the small areas under cultivation. At present the principal use is the grazing of cattle, hogs, goats, and work animals. Various grasses afford excellent pasturage and the water supply is generally good. In the fall or spring the ridges are burned over to improve the pastures.

Land of this type of soil is held at $8 to $10 an acre.

Large areas of this type are within easy hauling distance of the railroad, and there are many slopes and crests of ridges which could be used for the production of apples, peaches, plums, pears, and grapes. Cattle and hogs could apparently be raised successfully. Near-by areas of smoother land could be used to produce feed to supplement the pasturage afforded by the nontillable land. Where the slopes are very steep and rough forestry is the best use to be made of this soil type.

HANCEVILLE SHALE LOAM.

The typical Hanceville shale loam consists of 6 to 8 inches of reddish-brown loam or silt loam, underlain by yellowish-red, moderately friable clay which quickly changes into a compact, stiff red clay. Scattered over the surface are small chips and fairly large pieces of brownish to almost black, very fine textured shale. In places there are varying quantities of arenaceous shale and sandstone fragments. These may be so abundant that the type approaches a stony loam, and in such places the soil is a reddish-brown light loam, underlain at 5 to 8 inches by red clay mottled in the lower part with yellow. Bedrock frequently is reached within the 3-foot section.

This type occupies a comparatively small area in Faulkner County. Its principal occurrence is in the vicinity of Holland, on the slopes south of Turkey Creek, and west of Barney. It usually lies on slopes where the shale underlying the sandstone formation is exposed. There are a few small areas with a fairly smooth surface. These smooth areas represent the only part of the type in cultivation. The remainder is either so steep or so badly eroded that tillage would not be profitable. The greater part of the type is in forest, and forestry, together with the grazing afforded, is probably the best use for the type.

HANCEVILLE GRAVELLY FINE SANDY LOAM.

The Hanceville gravelly fine sandy loam differs from the Hanceville fine sandy loam in several respects. It has a much higher content of sandstone and shale fragments; the subsoil usually contains less clay and is more friable, the bedrock is encountered at a shallower average depth, usually at not more than 2 feet, and the type characteristically occupies ridges and slopes instead of undulating and gently rolling country. Typically the surface soil consists of a reddish-brown gravelly fine sandy loam 6 to 8 inches deep, overlying reddish-brown to red, heavy fine sandy loam, with yellow mottling in the lower part. Partly decomposed sandstone is encountered at about 2 feet.

This soil has its greatest extent in the northern part of the county, where it is the principal type. It is locally known as "gravelly land." Large areas occur on Horseshoe Mountain, on Batesville Mountain, in the vicinity of Enders, northwest of Mount Vernon, and extending eastward from a point just north of King Bridge to Holland. There are also scattered areas on ridges throughout the southern part of the county. The type occupies benchlike situations, gentle slopes, and fairly steep slopes. There are many drainage

courses along the sides of which there is an abundance of sandstone fragments. Crops suffer first from drought in places where the bedrock lies near the surface.

Although cultivation is sometimes rendered difficult by the large number of sandstone fragments present, this soil is highly esteemed for crop production, and fully 75 to 80 per cent of it is farmed. The remainder is forested with red oak, post oak, blackjack, hickory, and some shortleaf pine.

In growing cotton and corn, the principal crops, the ridge method is usually followed. A large part of the cotton land is fertilized, and yields from one-third to one-half bale per acre. Corn is ordinarily given good cultivation, but the yields are low compared with those of the corn belt, ranging between 12 and 20 bushels. Occasionally corn is planted in rows 6 feet apart and cowpeas are drilled between the rows, both crops being cultivated. The cowpeas are picked for seed, and the vines either cut for hay, turned under, or pastured off with the cornstalks. Some farmers broadcast cowpeas between the rows of corn at the last cultivation. The Silver Mine, Hickory King, and Early June are popular corn varieties. Besides corn a little wheat is grown. This grain ordinarily yields 8 to 10 bushels per acre.

Live-stock farming has not been developed to any large extent on the Hanceville gravelly fine sandy loam, but many farmers raise a few cattle which are sold to drovers traveling through the country. Cowpeas, native grasses, and sorghum are the principal hay crops, and fall-sown oats are also used to some extent for hay. On some farms soy beans, millet, and Sudan grass are grown to feed the stock, and peanut vines also are baled for hay.

In the northern part of the county the prevailing opinion is that apples do not do well. In the southern part, 5 miles north of Cato, there is one commercial orchard of about 80 acres in which, under scientific methods of pruning, spraying, and cultivation, not only apples but peaches, pears, plums, cherries, and grapes are grown successfully. Home orchards are common, and practically all kinds of vegetables are grown in gardens on this soil.

The ordinary selling price of land of the Hanceville gravelly fine sandy loam ranges from $12 to $20 an acre for improved farms, or $8 or $10 an acre for forested areas.

Like most sandy soils, the Hanceville gravelly fine sandy loam is low in organic matter, and the chief means of improving the type is to increase the content of this important soil constituent. This may be done through the growing of winter cover crops, and the use of legumes in crop rotations, and more rapidly where occasional crops are turned under green, thus adding not only the remains of the plants represented by the root crowns and roots but by the tops

as well. The practice of growing cowpeas between the rows of corn is a good one, as far as it goes. Litmus-paper tests indicate that the soil is deficient in lime, and this element should be supplied wherever practicable. Deep plowing usually results in increased yields of corn. Where land of this type had been plowed to a depth of about 10 inches a yield of 35 bushels per acre was obtained.

HANCEVILLE FINE SANDY LOAM.

The typical Hanceville fine sandy loam consists of a light-brown to brownish-gray fine sandy loam passing at 3 to 5 inches into yellowish or light-reddish fine sandy loam, which is underlain at 8 to 15 inches by yellowish-red or reddish-yellow to brick-red, friable fine sandy clay. The lower subsoil frequently is more compact than the upper part and is mottled with yellowish and in some places with grayish colors. In places the surface soil has a reddish cast, but this color is more usual in the Hanceville gravelly fine sandy loam. Small fragments of sandstone, chips of shale, and occasional moderately large fragments of sandstone occur, especially on slopes. These fragments are very much less abundant than in the Hanceville gravelly fine sandy loam, although as mapped many small very gravelly areas are included with the fine sandy loam. Some patches, as at Shady Grove Church, have a yellow subsoil, these inclusions being really Dekalb fine sandy loam. In places the upper subsoil is red or reddish yellow and the lower subsoil yellowish, with reddish mottling. On the whole, the subsoil shows more yellowish than that of the Hanceville loam, more of the fine sandy loam type having a reddish-yellow to yellowish-red instead of a brick-red subsoil.

The Hanceville fine sandy loam is closely associated with the gravelly fine sandy loam, and is of much smaller extent than the latter soil. In places the boundary between the two types is necessarily arbitrary. Large areas of the fine sandy loam lie northwest of Wooster, in the vicinity of Damascus and Guy, and northwest of Mount Vernon. It also occurs in a long, narrow strip along the Conway and Beebe Road, through Vilonia.

The surface drainage and underdrainage of this type are generally good, the exceptions consisting of narrow, poorly drained strips along some drainage courses. In these areas the subsoil is more yellow than typical, and in a few instances, as along the county road southwest of Guy, approximates the Conway fine sandy loam.

Because of its favorable topography and relative freedom from stones, almost all this soil is under cultivation. Practically the same crops are grown and the same methods employed as on the Hanceville gravelly fine sandy loam. Tillage operations are easier, and as

the bedrock usually is not so close to the surface there is less danger of crops being injured by drought. Where the surface soil inclines toward brownish gray and the subsoil is less red than that of the Hanceville gravelly fine sandy loam, the soil is known locally as "rabbit-skin land." Crop yields in such places are somewhat under the average for the type.

Practically the same methods are needed for the improvement of this type as are suggested for the gravelly fine sandy loam. At Vilonia an excellent stand of alfalfa has been obtained on this soil in a field of three-fourths acre. The success in this field is due to good drainage conditions, manuring, deep plowing, and thorough preparation of the land. The soil was inoculated with about 300 pounds of soil taken from another alfalfa field, and 1,200 pounds of ground limestone was harrowed in. The seeding was done September 18, and the first cutting was made about June 1. Alfalfa does not succeed on thin soils, where the bedrock approaches the surface.

HANCEVILLE LOAM.

The typical Hanceville loam consists of a light-brown to reddish-brown light loam, passing at 8 to 14 inches into red or yellowish-red, friable fine sandy clay subsoil, which usually is more compact and mottled to some extent with yellow in the lower part. Over most of the type the content of fine sand or very fine sand is relatively high, and there are many included areas of typical very fine sandy loam or fine sandy loam texture. The type nearly everywhere contains some small fragments of sandstone and frequently of shale, and some areas have moderately large sandstone fragments scattered over the surface. In some places, on the other hand, there is considerable silt and clay in the surface soil, the upper subsoil is a silty clay loam to clay loam, and the lower subsoil is a friable, red clay. Bedrock sometimes lies within 3 feet of the surface.

A large part of this type occupies the gentle lower slopes of ridges whose higher parts are occupied by the Hanceville stony loam or Rough stony land or both. It also occurs as gently undulating and gently rolling valley lands. The Hanceville loam does not form many large areas, but it is encountered in small areas in practically every part of the county. The principal areas are near Enders and in a broken belt extending from Happy Valley to Mount Vernon. In the southern part of the county it is developed on the long, narrow slopes of numerous ridges, usually occupying a position intermediate between the Hanceville stony loam on the upper parts, and the Conway silt loam on the lower parts of the slopes. In the large valleys there are a number of isolated areas of the type lying 3 to 10 feet above the surrounding Conway silt loam.

The surface drainage and underdrainage of the Hanceville loam are generally good. Erosion is comparatively active and in places gullies have grown to such an extent as to cause the abandonment of fields. Here much of the surface soil has been washed away and the red clay subsoil exposed.

The soil is one of the most important in Faulkner County. Owing to its comparative freedom from stones and its good drainage it is held in high esteem for cotton and corn, and at least 90 per cent of it is in cultivation. Various oaks, hickory, and some pine cover the forested areas.

Cotton is grown on this type under the methods prevailing in the uplands. Yields ordinarily range between one-fourth and one-half bale per acre, but the latter figure is surpassed in favorable years and where good cultural methods are employed. The yield of corn varies from 10 to 20 bushels per acre. Many farmers grow wheat and both winter and spring oats, but the total acreage of these crops is not large. The average yield of wheat per acre is 5 to 10 bushels. Most of the oats grown are fed in the sheaf to work stock. Very little rye is grown. Peanuts do well and the acreage devoted to the crop is increasing. Both sweet and Irish potatoes are grown for home use, and occasionally a surplus is sold locally. Vegetables and strawberries are grown successfully. Pears and apples do not do very well, owing, in part, to the prevalence of blight. Peaches of excellent quality are grown.

Live-stock farming has not been developed to any marked extent, though some farmers raise a few cattle and hogs. The stock consists mainly of grade Jersey cattle and Poland-China hogs.

The selling price of land of the Hanceville loam ranges from $12.50 to $30 an acre, nearness to towns and the character of improvements being the most important factors influencing prices.

A very large proportion of the fields of the Hanceville loam are used for the production of cotton and corn. After these crops have been gathered the fields are left bare until the following spring, the winter rains thus being allowed to leach and wash away valuable surface soil. There is an apparent need of winter cover crops to prevent soil erosion and to aid in maintaining productiveness through the addition of organic matter. Wheat, oats, or rye could be sown in the fall as cover crops. Crimson clover, sweet clover, and vetch are also good crops for this purpose. Rotations including such crops as potatoes, cowpeas, soy beans, Spanish peanuts, and, on fairly productive land, lespedeza are beneficial. Steep slopes subject to erosion require terracing.

In many instances there is need for improvement in cultural operations, such as deeper plowing of the lands and more frequent cul-

tivation of corn. In some cases late cultivations of corn are too deep. More care in the selection of seed, both of cotton and corn, also is needed.

CONWAY SILT LOAM.

The typical Conway silt loam consists of a light-brown silt loam passing at 3 to 10 inches into yellow or pale-yellow silt loam and at 10 to 15 inches into yellow or pale-yellow silty clay. This is underlain usually at 24 to 30 inches by a compact, impervious stratum of pale-yellowish silty clay mottled with grayish or reddish and usually containing black concretions. In places there is so much of this concretionary material that the stratum is a true hardpan. In road-cut exposures of the subsoil the depth and character of the compact lower-subsoil layer are seen to vary considerably in short distances. As thus determined the layer ranges in thickness from 12 to 40 inches. In some places it has but few concretions, while in others 50 per cent or more of its mass consists of concretionary material. In the more poorly drained situations the upper subsoil is pale yellowish and often mottled with gray. In some of the better drained areas it frequently has a reddish cast with no mottling, but it passes below into yellowish silty clay usually before the compact layer is reached. Some small concretions usually are present from the surface downward. Numerous dome-shaped mounds from 1 to 4 feet in height, occur in the type. The soil here consists of brown silt loam or very fine sandy loam underlain at 10 to 20 inches by yellow or reddish-yellow silty clay to fine sandy clay, with a compact stratum at 30 to 40 inches. Concretions are present in these areas.

The area of this type mapped at Bono is a rather well drained variation, containing numerous mounds. The soil between the mounds consists of 6 to 10 inches of brown silt loam, ranging in places near the mounds to very fine sandy loam overlying light-brown or light reddish brown silt loam to silty clay loam. This passes at 12 to 16 inches into either (1) reddish-yellow, friable fine sandy clay, with mottled reddish, yellowish, and grayish, compact material in the lower part containing considerable black concretionary material, or (2) yellow silty clay, compact and mottled with yellowish and grayish or reddish, yellowish, and grayish in the lower part, with some black concretions. The mounds in this well-drained variation consist of brown very fine sandy loam or silt loam passing into reddish-brown, friable fine sandy clay and this into yellow clay which is compact and mottled grayish and reddish in the lower subsoil and contains black concretions.

In some places, as in the vicinity of Greenbrier, colluvial material from the adjacent sandy Hanceville soils has covered a strip of the

typical Conway silt loam, giving rise to what really constitutes Conway fine sandy loam. These areas, however, are so small in extent that they are included with the Conway silt loam. In places shale is encountered within the 3-foot section, but shale chips are not common above the bedded shale.

The Conway silt loam is the typical valley soil of the county, occurring in large areas in the southern part, as in the vicinity of Bono, Greenbrier, Enola, Linder, Conway, Vilonia, and Cato. There is also a large area north of Enders, in the northern part of the county. The type occupies low, imperfectly drained areas whose surface varies from almost level to very gently undulating. There are pronounced differences in elevation within short distances. The low, flat areas known as "slash land" frequently are inundated, while the higher land has fairly good surface drainage, but usually imperfect underdrainage. About 75 per cent of the type is under cultivation, the remainder being forested with willow oak, post oak, hickory, and some sweet gum. Lespedeza and native grasses flourish.

The crops grown and the farming methods employed upon the Conway silt loam are practically the same as on the Hanceville loam. In addition to the ordinary short-staple varieties of cotton some long-staple cotton is grown by a few farmers, particularly in the vicinity of Cato. With differences in drainage conditions there is a wide range in the yields of the various crops. Cotton ordinarily yields from one-fourth to one-half bale per acre. The crop usually is fertilized at the rate of 100 to 150 pounds per acre with various complete fertilizers. A commonly used mixture has the formula 10 per cent phosphoric acid, 1.65 per cent nitrogen, and 0.75 per cent potash. On one farm 400 pounds of fertilizer per acre is used, and the results obtained seem to justify applications of a quantity as large as this. It is the experience of many farmers that a high percentage of phosphoric acid aids in the early maturing of cotton. The average yield of corn ranges from 10 to 15 bushels per acre. Cowpea vines and barnyard manure are used by a number of farmers to fertilize corn land, and yields of 20 to 30 bushels per acre are obtained. Winter Turf oats do well on this soil. As much as 20 bushels of wheat and 40 bushels of oats per acre have been produced.

Because of the prevailing hardpan, tree fruits do not generally succeed. In the better drained areas vegetables, including Irish and sweet potatoes, do as well as on any other soil in the county.

Cowpeas and sorghum give very good yields and are grown extensively for home use. Peanuts are increasing in favor as hog feed. A large area of the type is used as pasture land and for the production of hay. Cowpeas and prairie grasses are the most common hay

crops, but sorghum, redtop, millet, and Sudan grass also are grown. Lespedeza does well.

The selling price of this land ranges from $10 to $50 an acre. From $12.50 to $20 an acre is the ordinary price away from the towns.

One of the chief needs of the Conway silt loam is improvement in the drainage. In many places the land is sufficiently valuable for agriculture to warrant installing tile drains. Liming is generally beneficial. Fertilizers high in phosphoric acid are considered best for cotton. Crop rotations that include some of the legumes have been found advantageous. The growing of other winter cover crops also is beneficial. With the good pasturage afforded by the low areas and the good yields of corn obtained on the higher lying areas it would seem that the live-stock industry could well be developed.

POPE FINE SANDY LOAM.

The Pope fine sandy loam consists of a brown loamy fine sand to fine sandy loam, passing at 12 to 20 inches into lighter brown fine sandy loam or friable fine sandy clay. In a few places both the surface soil and subsoil have a reddish cast, due largely to the red color of the adjacent upland soils from which the material has been washed. Included with the type are small areas of Pope loam, which occur in depressions and along the outer margin of the typical soil.

The Pope fine sandy loam has its principal development along streams in the northern part of the county, where the currents are usually swifter and have deposited coarser sediments than the more sluggish streams to the south. Important areas occur along the North and East Forks of Cadron Creek and along Cove, Batesville, Mortar, and Mill Creeks.

There are marked differences in elevation in this type, some areas lying above ordinary overflows, as that southwest of Shady Grove Church. Drainage is good, and in places excessive.

Practically all the type is in cultivation to cotton and corn. The yields of cotton run from one-half to two-thirds bale and of corn from 20 to 40 bushels per acre. In a few high areas tomatoes, sweet potatoes, and peanuts are grown. Tillage operations require only light equipment.

The selling price of land of this type ranges from $10 or $20 an acre in remote sections and up to $40 an acre in more accessible locations.

To maintain good yields on the Pope fine sandy loam it is important to incorporate organic matter with the soil. Deep plowing should be practiced. The higher areas of the type are well adapted to the growing of various truck crops.

The following table gives the results of mechanical analyses of samples of the soil and subsoil of this type:

Mechanical analyses of Pope fine sandy loam.

Number.	Description.	Fine gravel.	Coarse sand.	Medium sand.	Fine sand.	Very fine sand.	Silt.	Clay.
		Per cent.	*Per cent.*	*Per cent.*	*Per cent.*	*Per cent.*	*Per cent.*	*Per cent.*
461403	Soil	0.0	0.2	0.3	37.1	31.4	26.0	5.0
461404	Subsoil	.0	.0	.4	35.8	29.4	26.8	7.6

POPE SILT LOAM.

The typical Pope silt loam consists of a brown, mellow silt loam passing at 10 to 20 inches into lighter brown or brownish-yellow, heavy silt loam or silty clay loam. In places some grayish and rusty-brown mottling occurs in the lower subsoil. This is the case in the more poorly drained situations, in areas representing an approach toward the Atkins silty clay loam. In such places black concretionary material may be encountered at depths of 30 to 36 inches.

This is a first-bottom soil developed along the upper courses of creeks and smaller streams principally in the southern part of the county. It occurs in fairly large areas along Muddy Bayou, both forks of Cadron Creek, Palarm Bayou, Cypress Creek, and many smaller streams. In places the areas are marked by sloughs and depressions. Drainage generally is good, although in some areas farthest from the streams it is deficient.

Uncleared areas support a growth of cane, black gum, sweet gum, willow oak, ironwood, box elder, sycamore, mulberry, white oak, elm, honey locust, and willow, with cypress along streams. The soil is very highly esteemed for corn and is well suited to cotton, and at least 80 per cent of it is in cultivation. A small acreage is used for growing oats.

The yields of corn vary from 25 to 60 bushels, and of cotton from one-half to three-fourths bale per acre. In some years the prevalence of rust and the occurrence of overflows reduce the yield of cotton. Cocklebur and crabgrass are troublesome in fields on this soil.

Many farmers who own upland farms own or rent land of this type because of its adaptation to corn. Commercial fertilizers are not used. Preparation of the seed bed is often begun later in the spring than on the upland soils, as this type retains water longer and weeds can be controlled better.

Land of this type sells for $25 to $50 an acre. Cash rent usually is $6 or $7 an acre.

In some bottom fields corn should receive more frequent cultivation in order to keep down the heavy growth of weeds which spring up on this soil. Ditches or tile drains would aid greatly in obtaining maximum yields.

The results of mechanical analyses of samples of the soil and subsoil of this type are given in the following table:

Mechanical analyses of Pope silt loam.

Number.	Description.	Fine gravel.	Coarse sand.	Medium sand.	Fine sand.	Very fine sand.	Silt.	Clay.
		Per cent.	*Per cent.*	*Per cent.*	*Per cent.*	*Per cent.*	*Per cent.*	*Per cent.*
461405	Soil	0.0	0.1	0.1	2.9	22.1	56.8	18.0
461406	Subsoil	.0	.0	.1	7.4	26.5	46.7	19.3

ATKINS SILTY CLAY LOAM.

The Atkins silty clay loam consists of a mottled grayish and brownish silty clay loam which passes at 3 to 5 inches into gray or bluish-gray silty clay loam mottled with brown, rusty brown, or pale yellowish, and then into similarly colored silty clay. The lower subsoil is a dense, impervious, bluish-gray clay, with yellowish or brownish mottlings. Usually small black concretions are present throughout the 3-foot section. In some places the silty clay loam extends to a depth of 15 to 30 inches and passes abruptly into the impervious stiff layer.

The type occupies poorly drained bottoms along streams receiving their drainage waters from the sandstone and shale hill country. It occurs along the North Fork of Cadron Creek southwest of Bono. Along the East Fork of Cadron Creek it extends from the Terry Bridge northeast almost to the Hardin Bridge. The type is also mapped southeast of Conway along Caney Creek, and along Greenbrier Creek and a number of smaller streams.

The greater part of the Atkins silty clay loam is forested with willow oak, water oak, sweet gum, red oak, and maple. Various grasses furnish good pasturage. Only a very small area of the type is used for growing cotton and corn. The ordinary yield of cotton is between one-third and one-half bale per acre and of corn 12 to 20 bushels per acre. The soil has a tendency to turn up in clods when plowed wet, and it runs together after rains. This soil can be made more productive by drainage.

Land of this type can be bought for $10 to $15 an acre.

The following table gives the results of mechanical analyses of samples of the soil and subsoil of this type:

Mechanical analyses of Atkins silty clay loam.

Number.	Description.	Fine gravel.	Coarse sand.	Medium sand.	Fine sand.	Very fine sand.	Silt.	Clay.
		Per cent.	*Per cent.*	*Per cent.*	*Per cent.*	*Per cent.*	*Per cent.*	*Per cent.*
461409	Soil	0.3	0.6	0.3	3.9	15.1	61.6	18.1
461410	Subsoil	.6	1.9	.7	4.1	14.5	57.6	20.9

ATKINS CLAY.

The typical Atkins clay consists of a mottled gray, yellow, and brown clay which passes at 10 to 20 inches into a dense clay of prevailingly bluish-gray color, usually mottled with yellow and brown. Brown and black concretionary material frequently occurs in the lower subsoil.

This is a low first-bottom soil, and much of it is subject to deep and frequent overflows. The surface is flat, and both surface drainage and underdrainage are poor. There are many small depressions, sloughs, ponds, and lakes, which are filled with water during the greater part of the year.

The largest areas of the Atkins clay lie southeast of Conway and in the vicinity of the Grassy Lakes. The type also occupies the Coley Pond, 4 miles west of Mayflower, and it occurs along North Fork of Cadron Creek southwest of Wooster and along East Fork of Cadron Creek near the Terry Bridge. There are a number of smaller areas elsewhere in the county.

While there is a relatively large extent of Atkins clay, it has practically no present value for crop production because of its poor drainage and liability to overflow. The forest consists principally of willow oak, overcup oak, sweet gum, hickory, tupelo gum, and cypress. In most places lespedeza and grasses are abundant.

The average selling price of land of the Atkins clay is about $10 an acre. This type would apparently be well adapted to crop production if the drainage were improved. The reclamation of these bottoms, however, will involve extensive engineering operations. In their present condition the cleared areas are suited to hay production and pasture. Lespedeza, Bermuda grass, and other grasses do well.

In the following table the results of mechanical analyses of samples of the soil and subsoil of this type are given:

Mechanical analyses of Atkins clay.

Number.	Description.	Fine gravel.	Coarse sand.	Medium sand.	Fine sand.	Very fine sand.	Silt.	Clay.
		Per cent.	*Per cent.*	*Per cent.*	*Per cent.*	*Per cent.*	*Per cent.*	*Per cent.*
461407	Soil	0.0	0.2	0.2	2.1	2.0	17.6	77.8
461408	Subsoil	.0	.1	.1	1.4	1.7	15.9	80.8

MUSKOGEE SILT LOAM.

The typical Muskogee silt loam consists of a light-brown silt loam about 6 or 8 inches deep, overlying a yellowish silty clay which passes below into mottled red, yellowish, and bluish, rather dense clay. Along the slopes chocolate-red clay is reached within the 3-foot section, and frequently is exposed in gullies. Small black

concretions are common through the soil, but usually are lacking in the mottled subsoil. There are some mounds made up of reddish clay loam or shallow silt loam. In other places the mounds consist of brown to yellowish-brown very fine sandy loam, which passes into reddish-brown, friable clay. The subsoil grades downward into a pale-yellow clay, and gray mottling occurs at 28 to 36 inches.

The Muskogee silt loam occupies terraces or second bottoms along the Arkansas River. The material was deposited as alluvium when the river flowed at higher levels than at present. The most important occurrence of the type is in the vicinity of Mayflower, where it extends along the St. Louis, Iron Mountain & Southern Railway for a distance of about 4 miles. A large area occurs west of Mayflower and another west of Providence Church.

In general the surface is almost level, although near the margin of the terrace washing and gullying have made a dissected and almost hilly surface in places. The drainage is in most places poor.

The principal trees on this soil are willow oak, post oak, sweet gum, red oak, and hickory. Lespedeza is abundant. About 75 per cent of the type is now in cultivation, with cotton and corn as the chief crops. Various other crops, such as sorghum, cowpeas, and sweet potatoes are also grown. There are small gardens in the higher and better-drained areas. Cotton yields average about one-third bale, and corn ordinarily 8 to 12 bushels per acre. Land used for the production of cotton usually is fertilized.

The selling price of land of this type of soil is $10 to $15 an acre.

For maximum crop production most of the Muskogee silt loam requires better drainage. In its present poorly drained condition much of the type is best suited to the production of pasturage and hay crops. In the better-drained areas higher yields could probably be obtained by growing such crops as cowpeas more extensively in rotations.

The results of mechanical analyses of samples of the soil and subsoil of this type are given in the following table:

Mechanical analyses of Muskogee silt loam.

Number.	Description.	Fine gravel.	Coarse sand.	Medium sand.	Fine sand.	Very fine sand.	Silt.	Clay.
		Per cent.	*Per cent.*	*Per cent.*	*Per cent.*	*Per cent.*	*Per cent.*	*Per cent.*
461418	Soil	0.5	0.5	0.3	3.3	27.9	56.5	10.8
461419	Subsoil	.3	.3	.1	2.2	20.3	50.4	26.2

PORTLAND VERY FINE SANDY LOAM.

The surface soil of the Portland very fine sandy loam is a brown or chocolate-brown very fine sandy loam, 8 to 15 inches deep. The sub-

soil consists of 2 or 3 inches of chocolate-brown silty clay loam, grading into chocolate-red, plastic clay, or it may be a friable, chocolate-red sandy clay. In depressions there are included small areas of Portland silt loam.

The Portland very fine sandy loam is not extensive. It occurs in isolated areas along the Arkansas River from a point west of Gleason to Palarm. Much of the type is subject to overflow only at times of exceptionally high stages of the river. Some areas as mapped really constitute a terrace.

The surface of this soil is level to very gently undulating. Drainage is good. In a few places the slopes of benchlike areas have been washed and gullied, exposing the red clay subsoil.

This soil in general is stronger and more highly esteemed for farming than the Yahola very fine sandy loam. It is largely used for growing cotton and corn. Small patches are devoted to melons, peanuts, and cowpeas, to which the type is well adapted. The average yield of cotton is one-half to 1 bale and of corn 40 to 50 bushels per acre.

Most of the Portland very fine sandy loam is valued at $75 to $100 an acre.

This soil is naturally productive. The growing of such crops as crimson clover or cowpeas in the rotation is an effective means of maintaining its productiveness. Deep plowing and frequent shallow cultivation give the best results with cotton, corn, or other intertilled crops.

PORTLAND SILT LOAM.

The Portland silt loam consists of a brown silt loam which passes at about 6 inches into chocolate-red silty clay. At 12 to 36 inches a light chocolate red clay, which shows some drab mottling in places, is encountered. In the lower 2 or 3 inches of the 3-foot section a chocolate-red very fine sandy loam is sometimes found. East of Lollie there is some variation from the typical soil. The surface material in places is gray and rusty brown, while the subsoil is a stiff, drab clay with only a slight chocolate reddish cast. Near the Davenport ford the surface soil consists of 2 to 6 inches of brown silt loam, and this passes abruptly into plastic red clay mottled with yellow and gray.

This type occurs in relatively small areas in the Arkansas River bottoms. It frequently occupies terracelike positions subject to overflow only at extremely high flood stages of the river. The type is most extensively developed near Lollie and at Palarm, at which two places wide variations occur both in the character of the soil and in its position above overflow. The surface ranges from almost flat to gently sloping. Drainage conditions are variable. At Lollie

the drainage is good, while in the larger areas farther east the soil is poorly drained and affords good pasturage. Lespedeza does well.

Practically all the well-drained part of the type is cleared and used for growing cotton and corn. On the typical soil cotton yields from two-thirds to 1 bale and corn from 50 to 60 bushels per acre.

The better areas of this type sell for $75 to $100 an acre, while less desirable land is valued at $25 to $50 an acre.

At Lollie the type occupies a part of a large plantation; corn is grown on typical well-drained areas, a part of the type is used for growing ensilage for beef cattle, and pasturage is furnished by the poorly drained areas. This combination seems to constitute the best use of the type as a whole.

PORTLAND CLAY.

The typical Portland clay is composed of a brown or chocolate-brown silty clay which passes into dark chocolate red silty clay. Frequently the upper subsoil, and in places even the soil is mottled with dark drab and rusty brown, and occasionally only chocolate-reddish mottlings are encountered within the 3-foot section, but chocolate-red clay invariably occurs within the lower subsoil or in the substratum. Occasionally the soil is dark chocolate brown, while in other places it is almost black, as near Gleason.

This is a first-bottom soil, the material of which has been derived from both the Permian Red Beds soils of western Oklahoma and from the sandstone, shale, and other soils of the drainage basin of the Arkansas River. The largest area occurs southeast of the junction of the North and East Forks of Cadron Creek, where the sediments have been deposited from the backwaters of the Arkansas River and also from the headwaters of the two creeks. Another important occurrence is northeast of Lollie, along the Tupelo Bayou. In this body a drainage ditch has reclaimed hundreds of acres in an area which formerly was the bottom of a lake. The type occurs also southwest of Mayflower and along Palarm Bayou southward from the Narrows.

The surface of the largest area is almost flat, with occasional sloughs. In the river bottoms proper the surface is almost level and flat in some places, while in others it is varied by many ridges and depressions. Except in the higher areas and where reclamation work has been done the type is generally poorly drained, and much of it is covered with water for 8 or 9 months of the year. Overflows are common, and at times inundations are prolonged for several weeks. The soil crumbles to a desirable tilth on drying. Plans have been made for reclaiming the Cadron Creek bottoms.

About 85 per cent of the Portland clay is forested with willow oak, hickory, elm, maple, willow, sweet gum, tupelo, and cypress. The remainder of the type, mainly in the river bottoms, east and

southeast of Red Hill School, and near Gleason, is used for growing cotton and corn and for pasturage and hay production. The yields per acre are about one-half to 1 bale of cotton, and 20 to 50 bushels of corn. Alfalfa gives good results.

The selling price of this land varies from about $10 an acre in the Cadron Creek bottoms to $50 or $75 an acre in the reclaimed areas along the Arkansas River.

In its present condition crop production is rather hazardous on this soil, because of the danger of overflows, and the surface water must be removed before tillage operations are possible. Most of the type could be drained by ditching. In its present state the production of hay and pasturage is the best method of using the low and poorly-drained areas. Lespedeza and Bermuda grass do well on this soil.

The following table gives the results of mechanical analyses of samples of the soil and subsoil of the Portland clay:

Mechanical analyses of Portland clay.

Number.	Description.	Fine gravel.	Coarse sand.	Medium sand.	Fine sand.	Very fine sand.	Silt.	Clay.
		Per cent.	*Per cent.*	*Per cent.*	*Per cent.*	*Per cent.*	*Per cent.*	*Per cent.*
461414	Soil	0.0	0.4	0.6	4.3	3.1	20.7	71.3
461415	Subsoil	.0	.2	.3	3.1	8.4	36.0	52.1

YAHOLA VERY FINE SANDY LOAM.

The Yahola very fine sandy loam consists of a light reddish chocolate brown very fine sandy loam, passing at depths of 12 to 24 inches into a chocolate-red or salmon-colored very fine sand to very fine sandy loam. In some places the subsoil is a grayish to yellowish, incoherent very fine sand. Included with the type as mapped are small areas of Yahola silt loam and Yahola very fine sand.

The Yahola very fine sandy loam occupies fairly large areas along the Arkansas River, where it either is separated from the river by Riverwash or forms the immediate banks of the river. In some places, as in the area east of the road north of Lollie, the type lies higher than elsewhere. In this body the land nearest the river is 12 to 15 feet lower than that east of the road, but all the area, with the exception of a few relatively small high patches, is subject to overflow. Levees have been constructed to protect the lower land. Drainage ranges from good to excessive.

The tree growth on this soil includes cottonwood, hackberry, sweet gum, walnut, and sycamore, with cypress near the river. Almost all the type is used for growing cotton and corn, or for pasturage. Low areas which are subject to frequent overflows have a good growth of grasses, principally lespedeza and Bermuda grass, and are used for

pasture. The average yield of cotton is one-half to two-thirds bale per acre, although yields of 1 bale are not uncommon. Corn yields from 30 to 50 bushels per acre. Only light implements are required for tillage operations. Seeding usually is much earlier than on the heavier river-bottom soils.

Land values on this type range from $50 to $100 an acre. Because of the extremely sandy nature of the surface soil and subsoil care is necessary on this type to conserve moisture during the growing season, as by frequent shallow cultivations. In some instances yields are beginning to decline. The growing of legume crops in rotation aids in maintaining the natural productiveness of the soil.

The results of mechanical analyses of samples of soil and subsoil of this type are given in the following table:

Mechanical analyses of Yahola very fine sandy loam.

Number.	Description.	Fine gravel.	Coarse sand.	Medium sand.	Fine sand.	Very fine sand.	Silt.	Clay.
		Per cent.	*Per cent.*	*Per cent.*	*Per cent.*	*Per cent.*	*Per cent.*	*Per cent.*
461430	Soil	0.0	0.1	0.1	1.7	33.6	60.1	4.3
461431	Subsoil	.0	.0	.1	3.4	41.6	45.6	8.9

MILLER SILTY CLAY LOAM.

The Miller silty clay loam consists of chocolate reddish brown silty clay loam passing at about 8 inches into dark reddish chocolate brown to chocolate-red silty clay. In places the surface soil ranges to chocolate brown, such areas representing the Portland silty clay loam. There are also places where the lower subsoil, from 30 to 36 inches, consists of chocolate-red very fine sandy loam, such areas representing inclusions of Yahola silty clay loam.

This type occurs in the Arkansas River bottoms. It is mapped in two strips to the northeast and in a large area southeast of Lollie. It is a first-bottom soil, occurring characteristically between the Yahola very fine sandy loam on the one side and the Portland clay on the other. It frequently slopes from the former to the latter. Drainage is good.

Almost all the type is occupied by cotton and corn. The yields of cotton are from three-fourths to 1 bale and of corn from 50 to 60 bushels per acre. The Miller silty clay loam is almost as strong a soil as the Miller clay, and it lies higher above overflow. The land has about the same value, being held at about $100 an acre.

MILLER CLAY.

The surface 8 or 10 inches of the Miller clay consists of a dark chocolate red silty clay. This overlies plastic, chocolate-red clay. In places there are slight mottlings of brown. The soil crumbles to

a desirable tilth on drying, a characteristic of most soils containing considerable lime.

This soil occupies low areas in the Arkansas River bottoms and is subject to overflow. The only area of importance occurs northeast of Lollie.

The type is considered one of the strongest and most desirable of the river-bottom soils, and it is very highly esteemed for the growing of cotton, corn, and alfalfa, which occupy almost its entire acreage. The average yield of cotton is about 1 bale and of corn 50 to 60 bushels per acre. The first cutting of alfalfa is made in the latter part of April, and about five cuttings are made in a season. The first cutting yields about 1½ tons per acre, and the last generally less than 1 ton per acre. The hay is baled and sold locally.

Heavy teams and plows are used on the Miller clay. The soil plows up in clods, but these crumble on drying. This soil gives an alkali reaction with litmus paper.

Practically none of this land is for sale; it is commonly valued at about $100 an acre.

RIVERWASH.

The term Riverwash is applied to areas of very recently deposited sand, lying below the level of the banks of the Arkansas River but above the river at its normal level. This land is mainly barren of vegetation, but some of the higher parts support a growth of Bermuda grass, willow, and cottonwood and may be used for pasture. In a few high-lying patches corn and watermelons are grown. Riverwash is overflowed almost every year.

ROUGH STONY LAND.

Rough stony land includes very stony ridge areas and steep slope land unfit for cultivation. As mapped it comprises very stony areas of the Hanceville stony loam. The slopes commonly occur on the south side of ridges. Rough stony land is mapped throughout the county. A large area occurs north of Conway, and there are many narrow belts north of Vilonia and near Chadwick. The principal timber growth is blackjack, post oak, red oak, and there is a scattering of shortleaf pine. The Rough stony land is best suited to forestry and grazing.

SUMMARY.

Faulkner County, Arkansas, is near the center of the State. It has an area of 651 square miles, or 416,640 acres. It lies within the Ouachita Mountain belt. The northern part of the county is characterized by tillable plateaus with intervening relatively narrow low-

land areas. The southern part comprises alternating belts of ridges and narrow valleys. Between these belts are relatively wide valley areas which constitute important farming land. The Arkansas River, Cadron Creek, Palarm Bayou, and Muddy Bayou are bordered by wide bottoms, a large part of which is cultivable.

Most of the early settlers of Faulkner County came from the southeastern States, and are native Americans. There are a number of German farmers near Conway, the county seat. The 1910 census gives the population of the county as 23,708. Conway is an important cotton market and educational center. The St. Louis, Iron Mountain & Southern Railway traverses the southwestern part of the county.

As recorded at Conway, the mean annual temperature is 60.7° F., and the mean annual rainfall is 46.72 inches. The precipitation usually is well distributed through the growing season. The average length of the growing season is 218 days.

The chief money crop is cotton. Corn is grown extensively for home use and the feeding of farm animals. Hogs and a few cattle are raised on every farm, but the county is not yet entirely self-supporting in meat products. Dairying has not been developed to any important extent. Many dipping vats are in use.

An increasing acreage is devoted to hay crops, such as prairie grass, oats, cowpeas, Bermuda grass, alfalfa, and sorghum. Minor crops and products are wheat, vegetables, cowpeas, peanuts, sorghum sirup, poultry, honey, and fruit.

Commercial fertilizers are used extensively for growing cotton. A few farmers manure the land used for growing corn. Under the almost exclusive growing of cotton and corn the soils are declining in productiveness. Winter cover crops are grown in only a small way.

The farm houses and barns are generally not very large or substantial, but the number of well-built houses and barns is increasing. White labor can be obtained for $1 a day or $15 to $20 a month and board. Negro labor is widely employed in the Arkansas River bottoms. About one-half the farms of the county are operated by their owners, and most of the remainder are operated on a share-crop basis. Upland farms away from towns sell for $10 to $25 an acre. Bottom-land farms range in price from $10 to $100 an acre.

The upland soils are residual from Pennsylvanian sandstones and shales. The alluvial soils, except those along the Arkansas River, have been formed from material derived from the near-by hills and valleys. The Arkansas River bottom soils consist of local upland sediments mixed with a large quantity of residual prairie sediments.

The upland soils are classed with the Hanceville and Conway series. The Hanceville soils have brown to reddish-brown surface

soils and red, moderately friable subsoils. The Hanceville stony loam is largely forested, but much of it could be used for raising live stock and growing fruit. The shale loam is of small extent. The Hanceville gravelly fine sandy loam and fine sandy loam types are used extensively for the growing of cotton and corn. They are lacking in organic matter and are generally in need of lime. The loam type is cultivated extensively; it has good drainage and is free from large quantities of rock fragments.

The Conway silt loam is the typical valley soil of the county. Much of the type is in need of drainage. The better drained areas give moderately good yields of cotton, corn, vegetables, and sweet and Irish potatoes. The wet areas furnish excellent pasturage and hay.

The brown first-bottom soils along the streams other than the Arkansas River are mapped as the Pope fine sandy loam and silt loam. They are particularly well adapted to the growing of corn. The gray equivalent of the Pope series is the Atkins, of which series the silty clay loam and clay are encountered in Faulkner County. These soils are prevailingly in need of better drainage.

The Muskogee silt loam is a poorly drained terrace soil occurring along the outer margin of the Arkansas River bottoms. It lies above overflow. Fair yields of cotton and corn are obtained on this soil.

The first-bottom soils along the Arkansas River are mapped as the Portland, Yahola, and Miller series.

The Portland very fine sandy loam and silt loam have brown surface soils and chocolate-brown to chocolate-red subsoils. Almost all their acreage is used for growing cotton and corn or as pasture land. The Portland clay is a very productive soil, but it is deficient in drainage. Parts of it have been reclaimed by ditching and as much as 1 bale of cotton per acre is produced.

The Yahola very fine sandy loam is used extensively for growing cotton and corn. A part of the type lies above normal overflow. Drainage is good.

The Miller series is characterized by chocolate-red or chocolate reddish brown surface soils and chocolate-red subsoils. The Miller silty clay loam and clay are among the most highly esteemed soils in the county, giving good yields of cotton, corn, and alfalfa.

Riverwash includes areas of loose sand which are frequently overflowed and have little agricultural value.

Rough stony land comprises very stony ridge areas and steep slope land. It is too stony or steep for cultivation, but is suited in some measure to forestry and grazing.

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[PUBLIC RESOLUTION—No. 9.]

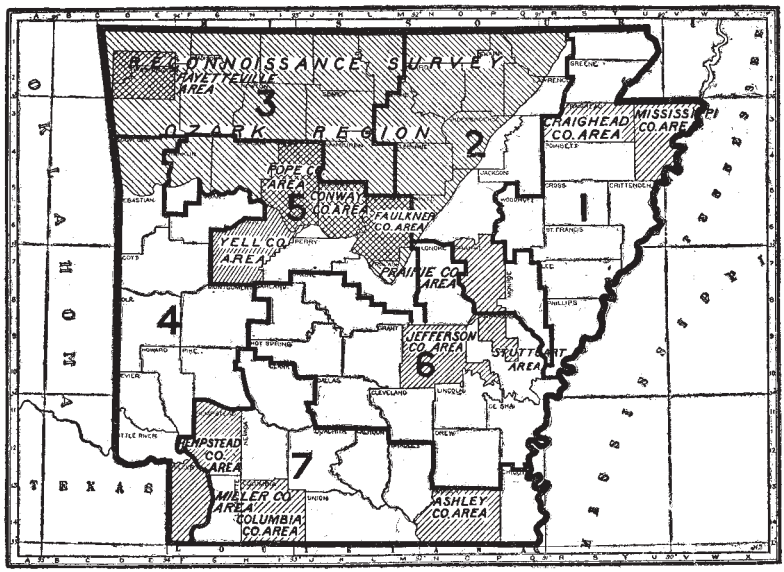
JOINT RESOLUTION Amending public resolution numbered eight, Fifty-sixth Congress, second session, approved February twenty-third, nineteen hundred and one, "providing for the printing annually of the report on field operations of the Division of Soils, Department of Agriculture."

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.]



Areas surveyed in Arkansas.

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