SOIL SURVEY OF ST. CLAIR COUNTY, ILLINOIS.

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LOCATION AND BOUNDARIES OF THE AREA.

St. Clair County is one of the southwestern counties of Illinois, lying between 38° 13′ and 38° 40′ north latitude and 89° 42′ 30″ and 90° 16′ west longitude. The county is of irregular outline, with a maximum length both north and south and east and west of about 30 miles. Clinton and Washington counties form its eastern boundary, Randolph and Monroe counties lie to the south, Monroe County and the Mississippi River border it on the west, and Madison County bounds it on the north. It contains an area of 650 square miles, or 415,872 acres. The Mississippi River washes its western border for a distance of 13 miles. Across the river lies the city of St. Louis—one of the largest markets in the country. Here, even in the early history of the county, the farmers found a ready market for their products, and this fact has contributed in no small degree to make St. Clair County one of the leading agricultural counties in the southern portion of the State. (See fig. 13, p. 465.)

HISTORY OF SETTLEMENT AND AGRICULTURAL DEVELOPMENT.

St. Clair County was once inhabited by the race known as the Mound Builders, as is evidenced by fifty or sixty mounds that still remain as monuments to their occupation. When the French Jesuits first visited this region the country was inhabited by tribes of the Illinois Indians, branches of the great Algonquin family. Agriculture received little attention at their hands, although small crops of corn, beans, potatoes, and peas were grown. The early settlers did not have a great deal of trouble with these Indians, although some stubborn and bloody battles were fought before the possession of the rich lands was abandoned to the whites.

The county of St. Clair, the oldest in the State, was organized in 1790 out of a part of the Northwest Territory. As originally constituted it embraced all of the State of Illinois south of the Illinois River. The history of its settlement begins, however, almost a hundred years before the United States existed as an independent nation. The first settlement within its present borders was made at Cahokia by French

Jesuits about the year 1686. This place was selected as a missionary station by the Jesuits. Indian traders soon followed, and the infant settlement was placed upon a substantial and permanent basis. The next settlement was at Prairie du Pont in 1760. The only American settlement within the present limits of the county at the beginning of the nineteenth century was at Turkey Hill and contained about 20 persons. Very soon, however, the American settlements began to increase rapidly, and in a few years the log cabin of the pioneer was to be seen in every part of the county. The settlers came principally from the South and from Pennsylvania.

In 1829 German immigrants began to arrive in considerable numbers, and the influx continued, until to-day they form the largest element in the population.

The first settlers found the uplands diversified with timber and prairie, the latter usually being small and found chiefly in the central and eastern portion of the county. The alluvial bottoms were generally timbered, although small prairies existed there also. The settlements were usually situated upon the margin of a prairie, near some stream or bayou.

The early settlements of the French and American pioneers differed very materially in character. The French settlements were in the form of small, compact, patriarchal villages. A long, narrow strip of land in the "common field," which extended from the river to the bluff, was allotted to each villager, the amount depending upon the size of his family. The "commons" furnished pasturage for the stock of the entire village. The American pioneers settled upon separate farms, often 3 or 4 miles apart.

Agriculture was at first carried on only to a very limited extent. The early settlers usually plowed the ground with wooden plows drawn by oxen yoked together by the horns. The wheat grown at first was almost all spring wheat, but later winter wheat was more largely introduced, and the growing of spring wheat was gradually discontinued. The wheat was cut with a sickle, winnowed with a sheet, and sold for about $1 a bushel. The growing of corn gradually increased until considerable quantities were shipped in flatboats to New Orleans, along with cattle and hogs raised for the same market. Irish potatoes produced a sure and abundant crop. Hay was cut from the prairies or grassy groves in the timber. Only small quantities of butter and cheese were produced, scarcely enough for home consumption. Apples and pears and a few apricots and peaches were cultivated. Cotton was tried, and some farmers planted as much as 4 or 5 acres to this crop, but other crops better adapted to the climate were found to be more profitable, and the growing of cotton was discontinued. The commerce on the river and the Indian trade consumed the surplus products of the farm.

CLIMATE.

A general idea of the climatic conditions of the area may be had by an examination of the appended table, compiled from Weather Bureau records, showing the normal monthly and annual temperature and precipitation at Mascoutah, situated in the eastern part of the area, and at St. Louis, on the western bank of the Mississippi River, directly opposite the northwestern corner of the area.

Normal monthly and annual temperature and precipitation.

Month.	Mascoutah.		St. Louis.	
	Temperature.	Precipitation.	Temperature.	Precipitation.
	° *F.*	*Inches.*	° *F.*	*Inches.*
January	31.3	2.82	30.5	2.18
February	31.3	3.21	35.1	2.75
March	42.5	4.06	43.1	3.53
April	55.4	4.11	56.2	3.68
May	63.9	4.97	65.8	4.64
June	75.6	4.31	75.2	4.92
July	78.9	2.89	78.8	3.77
August	76.4	2.33	76.8	3.36
September	70.2	3.27	69.4	2.99
October	56.2	1.98	57.5	2.79
November	42.1	3.55	43.6	3.08
December	35.3	2.35	35.6	2.71
Year	55.0	39.85	55.6	40.40

As deduced from data given by the same records, the average dates of killing frost are as follows: Mascoutah, spring, April 23; fall, October 15. St. Louis, spring, April 2; fall, October 26. This gives an average growing season for tender vegetation of 175 and 207 days, respectively. There is thus quite a difference in the season in the eastern and western parts of the area, due doubtless to difference in elevation and the influence of the river.

PHYSIOGRAPHY AND GEOLOGY.

The surface of St. Clair County presents a pleasing variety of river bottoms, hills, and prairies. The largest area of bottom land is found along the Mississippi River, which forms the western boundary of the county for a considerable distance. This bottom is a part of what is known as the "Great American Bottoms." (See Pl. XXVIII.) At the northern boundary of St. Clair County it extends back as far as Caseyville, 8 miles from the river, but narrows down to 3 miles in width at the southern boundary. Nearly all of this bottom lies between 400 and 420 feet above sea level. At times of great floods in the Mississippi River it is overflowed, but the damage from this source has been decreased by the building of levees. The Kaskaskia River, which enters the county

about midway of its eastern boundary and flows across it in a southwestern direction, forming the west-southern boundary, also has considerable bottom land along it. In its course through the area it swings from bluff to bluff, and on the side opposite the bluffs there are low, level strips of alluvial land sometimes as much as 2 miles in width. The bottoms along the Kaskaskia are generally timbered and contain many small lakes and bayous. Silver Creek, which enters from the north, and Richland Creek, which rises near O'Fallon, flow in a southern direction through the eastern and central portion of the county and empty into the Kaskaskia River. Both of these streams, as well as many other smaller ones, have narrow strips of bottom land along them. The Kaskaskia River is lower in St. Clair County than the Mississippi, and therefore receives the greater portion of the drainage.

The upland, which occupies the larger portion of the area, is more or less broken, depending somewhat upon the distance from the larger streams. The boundary between the upland and the bottoms is usually marked by a line of bluffs. This is especially true along the Mississippi River, where these bluffs rise to a height of from 100 to 250 feet above their base. Those along the Kaskaskia River are much less pronounced. The Mississippi bluffs are usually formed of loess, which overlies the glacial material, but beginning 3 miles south of Centerville Station and extending almost to Monroe County they are formed of an almost perpendicular wall of limestone 100 or more feet high. Above this limestone is about 6 feet of glacial material and from 50 to 100 feet of loess. In the rear of these limestone bluffs, in Sugar Loaf Township, are many sink holes.

The general character of the country along the bluffs is broken and hilly. The small streams, which are dry most of the year, have cut deep ravines, between which rise rounded ridges. These ridges are among the highest points in the county, sometimes reaching an elevation of 680 feet above sea level, and have been undoubtedly higher than at present, as it is evident that a great deal of soil has been removed by erosion. The divide between the Mississippi and the Kaskaskia rivers lies within a few miles of this bluff line. Back from the bluffs the surface becomes more level until in the central and eastern portion gently rolling prairies are found. Lebanon, Mascoutah, Shiloh Valley, and Prairie du Long townships are covered almost entirely by prairie, and many other smaller areas are found ramifying in a north and south direction between the streams.

A broken chain of glacial ridges, which probably represent a portion of an old moraine, enters the county north of Lebanon and extends southwestward to near Belleville. It there swings to the southward, following quite closely the course of Silver Creek. One of these

ridges in Freeburg Township, known as Turkey Hill, is the highest point in the county.

The geological formations in St. Clair County comprise the Quaternary, the lower 350 feet of the Coal Measures, and about 300 feet of the Subcarboniferous limestone. The lowest formation which is exposed is the Subcarboniferous limestone, which outcrops in the bluffs around the southwest border of the coal field. Above this limestone lie the Coal Measures, consisting of interstratified beds of sandstones, shales, and limestones. The Coal Measures embrace five coal seams, but only two of these are of any economic importance and only one is worked. This seam averages about 6 feet thick, and the coal is of a good quality. The coal has been a source of great wealth to St. Clair County, which ranks as the second county in the State in the quantity of coal produced. These seams underly three-fourths of the county. The dip, which is toward the east, is moderate and amounts to about 5 or 6 feet to the mile. At the close of the Carboniferous period there was an upheaval that resulted in the area occupied by the western coal swamps becoming permanently dry land. Erosion began its work and the upper portion of the Coal Measures was removed and the surface made somewhat irregular.

The formations underlying the St. Clair County area rarely outcrop, for they are covered with a deposit of drift material brought down by the ice at the time of the Illinois glaciation. This drift material varies in thickness from a few feet to 125 feet, and as the underlying rocks had been eroded into valleys which were subsequently filled with the drift material it is thicker in some places than in others, even where the surface is level. At the base of the drift there is usually a bed of plastic blue clay, containing sometimes a few pebbles. In other localities stratified sands are found below the clay. The glacial material outcrops along many of the streams, especially in southern and southwestern parts of the county and also in many places along the bluffs. As seen here it consists largely of a reddish-yellow or bluish gravelly till with which there is often mixed a considerable percentage of a reddish-brown sand. Very few bowlders were noticed. Many fragments of quartz as well as of granite and other igneous rocks occur, but a large part of the drift consists of the material ground off the sandstones, shales, and limestones of the Coal Measures by the ice as it moved over them. The drift material usually shows an imperfect stratification.

Overlying the gravelly till of the Illinois glaciation is a deposit of very fine sand, silt, and clay, of a yellowish or chocolate color, so slightly coherent that it can be readily pulverized between the thumb and fingers, and yet possessing sufficient tenacity to enable it to stand up in perpendicular walls where cut by stream erosion. This deposit contains shells, concretions of calcium carbonate, and pipes of iron,

and forms a part of the loess of the Mississippi Valley. This loess occurs as a natural levee along the bluffs, where it sometimes attains a thickness of 100 feet, but thins out rapidly toward the east. Except near the bluffs no typical sections of unweathered loess were seen, but the similarity of the material farther east to the weathered product leads to the belief that a thin layer of the loess extended over almost all of the upland. The particles composing the loess usually become coarser toward the bottom, and the material sometimes grades into a yellowish fine sand which shows evidence of stratification.

SOILS.

The different types of soil recognized in this area fall naturally into two main physiographic divisions, the alluvial bottom lands and the uplands. The names and areas of the different types are given below:

Areas of different soils.

Soil.	Acres.	Per cent.	Soil.	Acres.	Per cent.
Miami fine sandy loam	138,560	33.3	Kaskaskia loam	9,664	2.3
Miami silt loam	106,432	25.6	Lintonia loam	5,696	1.4
Marion silt loam	86,464	20.8	Yazoo loam	4,160	1.0
Yazoo clay	26,944	6.5	Total	415,872	.....
Waverly silt loam	25,152	6.0			
Yazoo sandy loam	12,800	3.1			

MIAMI FINE SANDY LOAM.

The Miami fine sandy loam consists of a loose, fine, and very fine sandy loam with which there is mixed a large percentage of silt. The soil has an average depth of 15 inches. When dry the color is a gray or pale yellow, but when moistened by rains it becomes a light brown. On the hills or bluffs, where erosion has been very active, the soil has been partially or entirely removed, and the heavier reddish-yellow subsoil is found near or at the surface. The soil gradually becomes finer in texture as one recedes from the bluff, the size of the grains and the amount of sand decreasing and the percentage of silt increasing until, near the eastern boundary of the area, the type becomes quite silty.

The subsoil is a yellow to reddish-yellow heavy silt loam, often quite hard but friable. This material extends to a depth of from 3 to 20 feet. Along the bluffs and back upon the uplands for several miles it is underlain by the unweathered chocolate or yellow-colored loess, which is sometimes as much as 100 feet in thickness near the bluffs, but which thins out rapidly toward the interior until it becomes so thin that the processes of weathering have extended downward entirely through it. Erosion has been much more active along the bluffs and

has removed the weathered material almost as fast as it has formed. The loess is underlain by the gravelly till of the Illinois glaciation. This glacial material outcrops in the deep ravines and along the foot of the bluff.

The following analyses show the texture of the Miami fine sandy loam, from which it is seen that the fine sandy character in the field is more apparent than real.

Mechanical analyses of Miami fine sandy loam.

No.	Locality.	Description.	Organic matter.	Gravel, 2 to 1 mm.	Coarse sand, 1 to 0.5 mm.	Medium sand, 0.5 to 0.25 mm.	Fine sand, 0.25 to 0.1 mm.	Very fine sand, 0.1 to 0.05 mm.	Silt, 0.05 to 0.005 mm.	Clay, 0.005 to 0.0001 mm.
			P. ct.	*P. ct.*	*P. ct.*	*P. ct.*	*P. ct.*	*P. ct.*	*P. ct.*	*P. ct.*
7027	2 miles NE. of O'Fallon.	Yellow to gray fine sandy loam, 0 to 16 inches.	0.61	0.06	0.34	0.36	0.78	2.80	87.46	7.88
7021	5 miles NW. of Belleville.	Gray fine sandy loam, 0 to 14 inches.	1.62	.52	1.00	.34	.46	3.34	85.30	8.92
7023	10½ miles W. of Belleville.	Pale yellow fine sandy loam, 0 to 14 inches.	1.37	.02	.36	.24	.58	3.60	85.64	9.56
7028	Subsoil of 7027.....	Yellow silty loam, 16 to 40 inches.	1.03	.02	.40	.44	.66	2.58	78.68	16.64
7022	Subsoil of 7021.....	Heavy yellow silty loam, 14 to 36 inches.	.42	.32	.90	.42	.68	2.96	77.04	17.32
7024	Subsoil of 7023.....	Yellow silty loam, 14 to 36 inches.	.46	.00	.24	.18	.32	1.82	76.00	21.08

The Miami fine sandy loam is found all along the bluffs, from which it extends back into the uplands for a distance of from 5 to 15 miles. It occupies the greater part of the area between Silver Creek and the Mississippi River bottom north of an irregular line drawn through Freeburg, Smithton, and Millstadt. It occurs in a broad extended area, broken somewhat by smaller areas of Miami silt loam. The surface is rolling to hilly. The bluffs rise rather abruptly to a height of from 100 to 250 feet, and are cut by deep gullies or ravines, between which are rounded, dome-shaped knobs and ridges. Farther back upon the uplands the surface becomes more level. Near the eastern border of the area the surface is more hilly, owing to the presence of the glacial ridges. In Sugar Loaf Township the surface is very irregular, on account of the large number of sink holes. These holes are from 50 to 200 yards in diameter and sometimes 50 feet deep. Many of them contain water. They are quite an impediment to the cultivation of the soil. The character of the surface and the underlying material give the Miami fine sandy loam good drainage.

The Miami fine sandy loam has been derived directly from the weathering of the loess. The loess is composed of sharp, angular, unweathered particles very uniform in size. It contains shells, concretions of calcium carbonate, and pipes of iron. There has been a great deal written about the origin of the loess and it is not the intention to go into a discussion of the subject in this place. As found here it is generally believed to represent the fine material ground up by the ice during the Glacial epoch, "borne southward by the streams and deposited in water just sufficiently in motion to carry the fine clay farther away."[a] Afterwards it became dry and was drifted about by the wind. It was certainly deposited after the Illinois glaciation, as it is found directly overlying the glacial material. As the unweathered particles of the loess are attacked by the processes of weathering they gradually give up their stores of plant food, thus serving as the source of a constant supply of most of the elements required for plant growth. The loess is generally rich in lime, magnesium, iron, aluminum, and potash.

Wheat, corn, oats, hay, Irish potatoes, orchard fruits, and market-garden crops are all grown upon the Miami fine sandy loam, but probably as much as one-half of the area is sown to wheat. This grain averages about 15 bushels per acre, although much larger yields are obtained in good seasons. Corn yields about 35 bushels, oats about the same, hay from 1 to 1½ tons, and Irish potatoes 75 bushels per acre. Much larger crops are obtained by the best farmers. Apples, pears, plums, peaches, cherries, and grapes do well on this soil and yield profitable returns. There is an excellent opportunity for development of the fruit industry, especially along the bluffs and in the other hilly areas. The soil is also adapted to the growing of strawberries, tomatoes, cabbage, and other market-garden crops, the cultivation of which could undoubtedly be made more profitable than the growing of grain.

MIAMI SILT LOAM.

The Miami silt loam is distinctly a silty soil. It is uniform in texture and contains a considerable percentage of organic matter, that gives to it a dark-brown color when moist. When dry and when it has not been stirred for several weeks the color becomes somewhat ashy. The soil adheres slightly when moist, but does not bake and is easily tilled. It is distinguished from the other upland soils by its darker color and heavier character. This soil type, where contiguous to the Marion silt loam, grades toward the latter. Occasional outcrops of "hardpan" are then seen, and some iron and calcium concretions are found. The soil is deepest in the depressions, sometimes extending to a depth of 36 inches, although the average depth is about 18

[a] Rocks, Rock-weathering, and Soils. Merrill.

inches. The subsoil, into which the soil passes by degrees, is a yellow or mottled-yellow silty clay loam, in which the silt is a very prominent component. When dry the subsoil becomes quite hard, though crumbling easily to the touch. When wet it is plastic. The character of the subsoil of the Miami silt loam is entirely different from the subsoil of the Marion silt loam. At a depth of 4 or 5 feet the silty clay loam material grades into the loesslike material that overlies the glacial till and is similar to the subsoil of the Miami fine sandy loam.

Below are given the mechanical analyses of samples of Miami silt loam:

Mechanical analyses of Miami silt loam.

No.	Locality.	Description.	Organic matter.	Gravel, 2 to 1 mm.	Coarse sand, 1 to 0.5 mm.	Medium sand, 0.5 to 0.25 mm.	Fine sand, 0.25 to 0.1 mm.	Very fine sand, 0.1 to 0.05 mm.	Silt, 0.05 to 0.005 mm.	Clay, 0.005 to 0.0001 mm.
			P. ct.	*P. ct.*	*P. ct.*	*P. ct.*	*P. ct.*	*P. ct.*	*P. ct.*	*P. ct.*
7029	7 miles N. and 1 E. of Belleville.	Brown silty loam, 0 to 15 inches.	2.86	0.32	0.56	0.18	0.28	3 34	86.24	9.08
7033	4 miles NE. of Mascoutah.	Brown silty loam, 0 to 16 inches.	3.22	.06	.40	.28	.42	3.78	84.62	10.44
7031	3 miles W. of Marissa	Brown silty loam, 0 to 14 inches.	2.41	.74	1.48	.46	.80	4.08	70.50	20.96
7030	Subsoil of 7029.....	Mottled-yellow silty clay loam, 18 to 36 inches.	.33	.70	1.00	.44	2.64	8.40	76.86	9.04
7034	Subsoil of 7033.....	Stiff silty clay, 16 to 36 inches.	1.13	.24	.64	.34	.60	2.56	80.82	14.80
7032	Subsoil of 7031.....	Mottled silty clay, 14 to 36 inches.	1.30	.54	1.36	.54	1.42	2.76	57.88	35.30

The Miami silt loam occupies almost the entire northeastern part of the county, where it is found in a broad extended area covering nearly all of Lebanon, Mascoutah, and Shiloh Valley townships and reaching south to Fayetteville. Another area of considerable extent, known as Ridge Prairie, is found near O'Fallon. Other smaller areas occur southwest of Belleville, south of Freeburg, and west of Marissa. There are some outcrops of "hardpan" in the two areas last named, and their average yield of crops is not as high as that of the areas farther north, where the hardpan is many feet below the surface.

The surface of the Miami silt loam is that of a level to gently rolling prairie. It is more rolling near the streams, because of the greater amount of erosion that has taken place there. It occupies slight depressions, probably the basins of old shallow lakes that have been gradually drained by erosion and changed into wet, grassy prairie. When the first settlers came to this country they found a large part of the area occupied by the Miami silt loam in this prairie condition. These areas were drained by cutting large open ditches through them,

and later by the very limited use of tile drains. Some of the areas in the southern part of the county are still too wet to produce good crops and should be drained.

The Miami silt loam has been formed by the weathering of the loess-like material which underlies it and the incorporation in the soil, while the areas were wet and swampy, of the organic matter resulting from the decay of the rank vegetation peculiar to moist situations. Silt also was washed in from the higher areas.

The Miami silt loam is the best type of upland soil in the county for general farming purposes. Wheat forms the principal crop, and this soil is generally considered one of the best types of soil in the State for growing this crop. Yields of 40 bushels per acre are reported, but such yields are very rare, and from 15 to 18 bushels will more nearly represent the average yield. Corn is the second crop in importance and will produce an average of 40 bushels per acre, although some farmers gather twice that quantity in good seasons. The yield of oats is about the same as that of corn. Clover and grass produce from 1 to 2 tons of hay per acre. Alfalfa is being tried upon the State experiment field near Mascoutah and promises good results. Irish potatoes are grown in considerable quantities, the yield being about 75 bushels per acre. This soil is easily cultivated, retains moisture very well, and is quite productive. It has been devoted too constantly to the production of wheat, and a more systematic rotation of crops should be practiced.

MARION SILT LOAM.

The Marion silt loam, to a depth of 10 inches, is composed of a gray to whitish or ash-colored silty loam, containing from 5 to 10 per cent of iron concretions about the size of small shot. The soil becomes somewhat hard after rains, but when stirred and pulverized it becomes loose. When dry it forms an impalpable dust, in texture about like flour. The "post-oak" lands are especially loose and silty and resemble ground-up chalk. Between the soil and the true subsoil is usually a layer, about 5 inches thick, of a white, powdery, siliceous silt and very fine sand, containing concretions of hydrated iron oxide. This layer seems very compact in the borings, but crumbles and pulverizes very readily between the thumb and finger. It is sometimes absent, and this most often happens upon the more rolling areas along the streams. At a depth of 15 inches the true subsoil is reached. This is a distinctive feature of the Marion silt loam and exercises a leading influence upon the agricultural value of the type. It consists of a hard, intractable, impervious, very silty clay of a mottled brownish-yellow color, and contains many iron concretions. In some instances concretions of calcium carbonate were also noticed. This subsoil is locally known as "hardpan." Where the soil is shallow and the subsoil reaches the surface there are found the so-called "scalds" or bar-

ren spots. It is very difficult to plow these spots, and after a heavy rain the ground runs together and becomes as hard as before. The subsoil holds water like an earthen vessel. One of the most common methods of obtaining water for stock is to excavate a hole 3 or 4 feet deep and allow the rain water to accumulate therein. An instance was noticed where one of these ponds was within 10 feet of a well 20 feet deep, yet so impervious is the subsoil that water in the pond remains until carried off by evaporation.

There is usually a gradation from the Marion silt loam to the Miami fine sandy loam or the Miami silt loam, and no sharp boundary exists between them, although where typically developed the three types are very distinct.

The mechanical analyses of samples of Marion silt loam are given below:

Mechanical analyses of Marion silt loam.

No.	Locality.	Description.	Organic matter.	Gravel, 2 to 1 mm.	Coarse sand, 1 to 0.5 mm.	Medium sand, 0.5 to 0.25 mm.	Fine sand, 0.25 to 0.1 mm.	Very fine sand, 0.1 to 0.05 mm.	Silt, 0.05 to 0.005 mm.	Clay, 0.005 to 0.0001 mm.
			P. ct.	*P. ct.*	*P. ct.*	*P. ct.*	*P. ct.*	*P. ct.*	*P. ct.*	*P. ct.*
7008	3 miles W. of New Athens.	Light-gray silty loam, 0 to 12 inches.	2.04	0.10	1.04	0.66	0.74	2.96	82.94	11.48
7004	2 miles E. of Lenzburg.	Gray silty loam, 0 to 16 inches.	1.45	.44	.80	.50	.56	7.40	78.66	11.56
7006	1½ miles W. of Darmstadt.	Gray silty loam, 0 to 14 inches.	1.08	.90	1.54	.58	.66	2.60	77.84	16.08
7009	Subsoil of 7008.....	Silt and sand, 12 to 20 inches.	.90	1.10	1.76	.98	1.06	3.50	79.76	11.84
7005	Subsoil of 7004.....	Silty clay, 16 to 36 inches.	1.19	.40	1.04	.70	1.00	4.32	63.82	28.28
7007	Subsoil of 7006.....	Yellow clayey silt, 14 to 36 inches.	.48	.16	.78	.48	.96	2.18	57.20	37.50
7010	Subsoil of 7008.....	Mottled silty clay, 20 to 36 inches.	.99	.14	.66	.58	.80	1.58	58.04	38.06

The greater part of the southern one-third of the county is covered by the Marion silt loam. Beginning near Millstadt, the area extends in a southeastern direction and takes in the larger part of Prairie du Long Township. Areas also occur south and east of New Athens, and Fayetteville and Marissa townships are composed largely of this soil type.

The Marion silt loam is most typically developed upon the level to gently rolling prairies in Clinton County and other counties lying east of St. Clair. (See Pl. XXVII.) The surface in St. Clair County is more diversified. In Prairie du Long Township and around Darmstadt level to gently rolling prairies are found, but the surface in the other areas is more broken and hilly, due to the greater amount of erosion. These areas, owing to the rolling and hilly character of the sur-

face, possess good natural drainage, but the more level prairies would be improved by drainage. Some difficulty is experienced, however, from the impervious character of the subsoil, but open ditches to carry off the water which covers the surface after heavy rains would undoubtedly be beneficial.

The Marion silt loam represents the weathered product of a thin layer of loesslike material which overlies the gravelly till of the Illinois glaciation. In some instances the soil seems to be derived directly from the glacial material itself. It is very probable the loesslike material from which this soil is derived once covered the whole area and the country to the east. In exposed places it has been removed by erosion, and the glacial material comes to the surface. The Marion silt loam seems to be closely connected also with the glacial material, for wherever the latter is exposed there are found evidences of the so-called hardpan, which forms the subsoil of the type. The Marion silt loam is found much nearer the bluff near Millstadt than anywhere else in the area, and here the glacial material, on account of an anticline in the underlying limestones, is much nearer the surface than at other places along the bluff.

The Marion silt loam is recognized as a poor type of soil for general farming. Wheat does better than any other grain. The average yield for this year (1902), which has been an exceptionally good year, was between 20 and 25 bushels per acre, but the average for a period of ten years is probably not more than 12 bushels per acre. Seventy-five per cent of this type is seeded to wheat each year. The reason why wheat produces better than other grain crops is probably because there is more moisture in the soil in the spring and early summer than later in the season. In addition to other factors, plants require a proper supply of moisture and also room for the development of their roots. The hard and impervious subsoil acts as a very poor storehouse for moisture and also hinders the root growth. Corn requires moisture at the time of the year when evaporation is greatest, and unless the soil absorbs and holds the moisture which falls as rain, so that the corn can have a supply to draw upon during periods of dry weather, the crop will be cut short. This soil is therefore very poorly adapted to corn, and the yields obtained are very light. Hay is grown and yields about 1 ton per acre. Fruits—such as apples, pears, peaches, and strawberries—thrive, and if cared for properly would give much more profitable returns than grain. The fruits do best where the surface is rolling and the subsoil more easily penetrated by the roots. More attention should be given to the growing of fruits.

The Marion silt loam in St. Clair County will average better than the same soil in Clinton County. The subsoil contains less iron and is not quite so hard, especially in the areas southwest of Freeburg and around Darmstadt. Its light, almost white color indicates that it is in need of organic matter, which should be supplied by the use of stable

manure and the plowing under of cowpeas, clover, and other leguminous crops.

YAZOO CLAY.

The soil of the Yazoo clay to a depth of 6 inches consists of a dark-brown to drab-colored clay loam, with which there has been mixed a large percentage of silt. When wet it becomes almost black, its dark color being due to the large amount of organic matter which it contains. When dry it cracks open, but these cracks usually do not extend to a depth of more than 4 inches, although instances were noticed where they reached to a much greater depth and were of sufficient width to admit one's hand. The soil possesses the property of granulation to a very remarkable degree. As soon as the soil begins to dry after a rain it begins to check into cubes. This process of granulation continues until the entire surface is covered with an inch or more of loose material. This property of granulation has given to the soil the local name of "buckshot" land. It is also spoken of as "gumbo," on account of its sticky nature when wet. It is so adhesive that 3 or 4 inches of the surrounding soil will stick to the auger when it is withdrawn from a boring.

The subsoil to a depth of 40 inches consists of a tough, plastic, sticky, drab-colored clay containing much silt, but retaining the properties of a clay. The depth of this clay varies in different parts of the area. Some wells have been dug to a depth of 20 feet before reaching the underlying sand, but the average depth of the clay subsoil is probably not over 4 or 5 feet, and sometimes, near the boundary between this type and the Yazoo sandy loam, the clay does not extend below 3 feet from the surface.

The following analyses show the heavy character of the Yazoo clay:

Mechanical analyses of Yazoo clay.

No	Locality.	Description.	Organic matter.	Gravel, 2 to 1 mm.	Coarse sand, 1 to 0.5 mm.	Medium sand, 0.5 to 0.25 mm.	Fine sand, 0.25 to 0.1 mm.	Very fine sand, 0.1 to 0.05 mm.	Silt, 0.05 to 0.005 mm.	Clay, 0.005 to 0.0001 mm.
			P. ct.	*P. ct.*	*P. ct.*	*P. ct.*	*P. ct.*	*P. ct.*	*P. ct.*	*P. ct.*
7041	1½ miles S. of Prairie du Pont.	Brown silty clay loam, 0 to 6 inches.	4.28	0.14	0.83	0.62	1.77	12.98	48.83	34.83
7043	1¾ miles W. of Caseyville.	Brown silty clay loam, 0 to 7 inches.	4.01	.18	1.28	.78	1.96	5.78	51.20	38.38
7045	1½ miles SE. of East Carondelet.	Brown silty clay loam, 0 to 5 inches.	2.97	.00	.66	.72	3.40	7.68	42.82	44.80
7044	Subsoil of 7043.....	Heavy silty clay, 7 to 36 inches.	.92	.10	.36	.36	1.58	5.38	49.54	41.82
7046	Subsoil of 7045.....	Drab silty clay, 5 to 36 inches.	1.06	.00	.30	.40	1.92	3.40	49.12	44.50
7042	Subsoil of 7041.....	Drab silty clay, 6 to 40 inches.	1.78	.00	.44	.34	1.84	6.44	39.78	50.16

A large part of the American Bottoms in St. Clair County is covered by a deposit of the Yazoo clay. This type of soil was first recognized in the Yazoo River delta in Mississippi, and as it has also been found along the Illinois River in Tazewell County, it is probable that it covers a large percentage of the bottom lands along the Mississippi River and its tributaries. A large area of this soil is found in and around East St. Louis, where it is fast being taken up for building purposes. It occupies nearly all of the bottom between East St. Louis and the bluffs. Another large area is found in the southern part of the bottom, and a few smaller areas occur along the Kaskaskia River.

The generally level character of the surface of the Yazoo clay is somewhat broken by low ridges and by depressions. The latter represent old lake beds or bayous left after the overflow of the river. Some of these lakes are still undrained and contain water during a large part of the year. One of the largest lies in the northern part of the area. Another one is situated south of Centerville Station. The greater part of the area of this soil could be improved by underdrainage, and there are large tracts that are entirely too wet and swampy for cultivation. The elevation above the river is so little that it would probably be necessary to use the pump in draining some areas. The great and lasting fertility of the soil, coupled with the nearness of the St. Louis market, would probably make its reclamation profitable.

The origin of the alluvial bottom lands in general, as a deposit from the flood waters of the river, has already been indicated. The Yazoo clay represents the accumulation of the finest particles held in suspension by the water and deposited where there was little current. The precipitation of material as fine as that which makes up the body of the Yazoo clay would be prevented by even a moderate motion. Even in quiet water, such as would be found in depressions after the subsidence of the flood, the precipitation of the sediment could well consume a period of weeks. The position of the soil in the depressions and low areas generally attests its formation by deposition under the conditions described.

The American Bottoms are widely known for their fertility, and this fame is largely due to the productiveness of the Yazoo clay. It is an exceedingly fertile soil and has produced crops for many years without any diminution of its productiveness. Wheat, corn, oats, and hay are the principal crops grown, and where properly drained excellent crops are obtained, although the average yield is not very high because of the poor drainage. Wheat produces about 15 bushels, corn 50 bushels, oats 35 bushels, and hay 1 to 1½ tons to the acre. Some difficulty is experienced in getting a good stand of wheat on account of a tendency of the plants to winterkill. The damage from this source could no doubt be lessened by underdraining. Irish potatoes and tomatoes are grown, but these and similar crops do better on the

lighter soils. This type was originally heavily timbered with some small prairies scattered through the timber, but it is now largely cleared. The uncleared areas are used as pastures.

WAVERLY SILT LOAM.

The soil of the Waverly silt loam is a whitish to brown silty loam. Along the streams which issue from areas of Miami fine sandy loam there is a decrease in the amount of silt present and a corresponding increase in the percentage of fine and very fine sand. This silty loam material extends to an average depth of 14 inches, although instances were noticed where there was very little change to a depth of 36 inches. The subsoil consists of a gray or mottled yellow clay containing a very large proportion of silt. Both soil and subsoil show brown iron stains and often a small percentage of iron concretions.

The following are analyses of samples of Waverly silt loam:

Mechanical analyses of Waverly silt loam.

No.	Locality.	Description.	Organic matter.	Gravel, 2 to 1 mm.	Coarse sand, 1 to 0.5 mm.	Medium sand, 0.5 to 0.25 mm.	Fine sand, 0.25 to 0.1 mm.	Very fine sand, 0.1 to 0.05 mm.	Silt, 0.05 to 0.005 mm.	Clay, 0.005 to 0.0001 mm.
			P. ct.	*P. ct.*	*P. ct.*	*P. ct.*	*P. ct.*	*P. ct.*	*P. ct.*	*P. ct.*
7019	1¼ miles N. of New Athens.	Mottled gray silty loam, 0 to 20 inches.	1.10	0.34	1.00	0.84	3.56	15.72	61.60	17.02
7017	1 mile W. of Mascoutah.	Brown silty loam, 0 to 12 inches.	2.16	.24	.24	.24	1.78	7.12	72.32	18.10
7020	Subsoil of 7019.....	Heavy silty loam, 20 to 40 inches.	.20	.76	1.38	1.14	5.10	7.52	68.62	15.20
7018	Subsoil of 7017.....	Drab silty loam, 12 to 36 inches.	1.18	.16	.52	1.46	11.00	7.24	61.44	18.60

The Waverly silt loam is not a very extensive or important type. It is found along the smaller streams and in high-lying areas near the foot of the bluffs along the Kaskaskia River. The surface is generally level, and it is subject to occasional overflows. Much of it is low and wet and in need of artificial drainage. Some of the areas along the smaller streams are, however, elevated enough to insure good drainage. The greater part of the areas require diking to protect them from overflow.

This type of soil has been washed from the hills by the rains and deposited over the level lands at the foot of the hills, or has been transported by the streams to a greater distance and spread out over their bottoms by overflowing waters.

Like the Kaskaskia loam, the greater part of this type of soil is still covered by its original growth of timber. More of it has been cleared

and brought under cultivation along the smaller than along the larger streams. This is due to the better drainage conditions which exist there and to the less damage from floods. These streams, coming only a short distance and having more fall, do not, when they overflow, remain over the land as long as the larger streams and therefore do much less damage. Corn and grass are the two principal crops grown on this type of soil. Yields of from 40 to 50 bushels of corn and of 2 tons of hay to the acre are obtained in favorable seasons. The Waverly silt loam is not as good a soil as the Kaskaskia loam. It contains less organic matter and does not retain moisture as well.

YAZOO SANDY LOAM.

The soil of the Yazoo sandy loam consists of a pale-yellow or brown sandy loam or loamy sand with an average depth of 12 inches. The size of the grains of sand varies somewhat in different places, from the medium to the very fine grades. Near areas of Yazoo clay the soil becomes more loamy in character, a condition due to the larger amount of finer material which it carries. It is also more loamy in the hollows between the sandy ridges, and in general it is more sandy near the Mississippi River. The brown phase is heavier and contains more organic matter. The subsoil is heavier than the soil and consists of a pale-yellowish, fine, very sandy loam or, as near the Yazoo clay, sometimes of a silty clay. There is no sharp line of demarcation between the soil and subsoil, but rather an almost imperceptible grading of one into the other.

Below are given the mechanical analyses of samples of Yazoo sandy loam:

Mechanical analyses of Yazoo sandy loam.

No.	Locality.	Description.	Organic matter.	Gravel, 2 to 1 mm.	Coarse sand, 1 to 0.5 mm.	Medium sand, 0.5 to 0.25 mm.	Fine sand, 0.25 to 0.1 mm.	Very fine sand, 0.1 to 0.05 mm.	Silt, 0.05 to 0.005 mm.	Clay, 0.005 to 0.0001 mm.
			P. ct.	*P. ct.*	*P. ct.*	*P. ct.*	*P. ct.*	*P. ct.*	*P. ct.*	*P. ct.*
7035	1 mile W. of Prairie du Pont.	Fine sand, 0 to 14 inches.	0.55	0.00	0.04	0.06	40.48	47.78	9.32	2.32
7037	1¼ miles SW. of Caseyville.	Sandy loam, 0 to 7 inches.	1.94	.54	1.36	1.14	2.68	16.84	71.80	4.94
7039	¼ mile S. of Church.	Brown sandy loam, 0 to 18 inches.	1.89	Tr.	.44	.20	16.48	42.38	27.36	12.82
7036	Subsoil of 7035.....	Pale yellow fine loamy sand, 14 to 36 inches.	1.24	.02	.08	.14	7.06	45.00	43.44	3.74
7038	Subsoil of 7037.....	Sandy and silty loam, 7 to 36 inches.	1.81	.14	.80	.42	1.98	15.88	74.64	5.22
7040	Subsoil of 7039.....	Yellow sandy loam, 18 to 36 inches.	.91	.00	Tr.	.14	6.96	38.84	44.58	9.92

The largest area of this type of soil is found along the front lands of the Mississippi River, beginning just south of East St. Louis and extending along the river to the Monroe County line. Other smaller areas are found scattered over different portions of the American bottoms. It also occurs in small areas along the Kaskaskia River, the largest of these areas being east and south of Fayetteville. It occupies the higher, better-drained parts of the bottom land. The surface is slightly rolling and is made up of a series of low, sandy ridges between which occur slight depressions. There is probably not more than 10 or 15 feet difference in its elevation in any portion of the Mississippi bottom. Owing to its position in the higher areas and its sandy texture this soil usually possesses good drainage. The entire bottom lands are sometimes overflowed during the great floods in the Mississippi River, but the greater portion of the areas occupied by this soil type are seldom covered with water. Levees have been built in many places, and the danger from overflow has been decreased.

The origin of the Yazoo sandy loam is found in the great floods of the Mississippi River. One of the greatest upon record occurred in 1844, when the river spread from bluff to bluff and was of sufficient depth to allow the passage of steamboats near the bluffs. It is said that deposits 10 feet in thickness were left by this single flood. The effect of water transportation is to sort the suspended particles, the heavier being deposited first upon slacking of the current. The Yazoo sandy loam represents this heavier deposition. The sand is composed largely of quartz.

Almost all crops produced in this section can be grown upon the Yazoo sandy loam. It is too light and sandy, however, for general agricultural purposes. The heavier phase will produce fair crops of corn, but it should not be used for any except the early varieties. It is well adapted to the growing of truck and market-garden crops, and considerable areas, especially near East St. Louis, are being used for this purpose. There is yet room for a greater development of this industry. Watermelons, muskmelons, strawberries, cabbages, tomatoes, and many other similar crops could be grown with much profit. The soil is situated near one of the great markets of the country, and a ready sale would be assured for a much greater quantity of this class of products. A more intensive system of cultivation and the exclusive use of these soils for truck and market-garden crops would cause an increase in their value.

KASKASKIA LOAM.

The soil of the Kaskaskia loam consists of a brown loam containing much silt and having a depth of 9 inches. Its structure varies from compact to granular. In most instances where this soil had been cultivated this slightly granular structure was noticed. It is a rather heavy loam, the heaviness being due to the large percentage of silt which it contains. Thoroughly mixed with this soil also is a large

percentage of the decayed organic remains resulting from the heavy forest growth which is found upon it. As is often the case in alluvial soils, there is no sharp line of demarcation between the soil and the subsoil, the latter gradually becoming heavier with depth on account of the increase in the proportion of silt and clay contained. The subsoil is a mottled gray and yellow silty loam, often quite heavy in the low places, but frequently becoming somewhat sandy in the lower depths.

The mechanical analyses of Kaskaskia loam are given below, from which it is seen to contain much more clay than the field examination would indicate.

Mechanical analyses of Kaskaskia loam.

No.	Locality.	Description.	Organic matter.	Gravel, 2 to 1 mm.	Coarse sand, 1 to 0.5 mm.	Medium sand, 0.5 to 0.25 mm.	Fine sand, 0.25 to 0.1 mm.	Very fine sand, 0.1 to 0.05 mm.	Silt, 0.05 to 0.005 mm.	Clay, 0.005 to 0.0001 mm.
			P. ct.	*P. ct.*	*P. ct.*	*P. ct.*	*P. ct.*	*P. ct.*	*P. ct.*	*P. ct.*
7013	1 mile W. of New Athens.	Brown loam, 0 to 9 inches.	2.75	0.02	0.54	0.68	2.92	2.66	57.44	35.66
7015	6 miles SE. of Mascoutah.	Brown loam, 0 to 12 inches.	3.49	.06	.14	.36	8.80	4.74	42.98	42.84
7016	Subsoil of 7015.....	Mottled drab silty loam, 14 to 36 inches.	1.19	Tr.	.44	.72	18.02	9.14	42.08	28.86
7014	Subsoil of 7013.....	Drab silty clay, 9 to 36 inches.	1.33	.16	1.36	.86	1.60	1.54	50.52	43.94

This soil is found in the low alluvial bottoms along the Kaskaskia River within the area. The Kaskaskia bottoms are not very wide, and therefore this type of soil does not occur in as large areas as are found in Clinton County. At Fayetteville, and extending north for 2½ miles, the bluffs come very close to the river and in times of flood back the waters over the bottoms for miles up the stream. From Fayetteville south the soil occurs as a strip with an average width of about one-half mile, narrowing down in some places and then widening out again.

The surface of this soil is in general level, but is somewhat broken by the many bayous and lakes which have been formed during the overflow of the river. They represent old stream channels which have been left in the swinging of the stream when, during some time of very high water, the river has made for itself a new channel. The entire area occupied by the Kaskaskia loam is subject to overflow, and in many places the water has remained a sufficient length of time to leave a watermark from 4 to 6 feet from the ground. The river, however, does not overflow every season, and in these years it would be possible to grow fine crops. The greater portion of the area would require drainage, which could be accomplished in many instances by

draining into the old lakes or bayous. In order to insure the crops against damage or destruction from overflow it would be necessary to construct levees.

The fall in the Kaskaskia River within the area is not as great as that of the Mississippi at St. Louis, and the current is not as swift. When after heavy rainfalls the river, carrying in suspension its heavy load of material washed from the country to the north, rises and overflows its banks, its current is checked, and a part of its load is deposited. Mixed with this deposited material is the organic matter resulting from the decay of the leaves and dead limbs which drop from the heavy forests, together with that which accumulates from the decay of the undergrowth. This process of alternating deposition of mineral and organic matter, continued for years and still continuing, has produced the Kaskaskia loam.

Nearly all of the Kaskaskia loam is still covered with a heavy forest of oak, elm, maple, hickory, birch, sycamore, and many other trees. A few small areas more elevated than the general body of the soil have been cleared and cultivated and produce excellent crops of corn and hay, but there is always danger that the crops may be destroyed by an overflow of the river. The Kaskaskia loam is a very fertile soil and if it were protected from the floods and properly drained it would produce very fine crops of corn and hay.

LINTONIA LOAM.

The Lintonia loam consists of a brown loam with which there is mixed a considerable percentage of fine and very fine sand and silt. The soil, however, retains the characteristics of a loam rather than a sandy loam. It is quite uniform in texture to a depth of 20 inches, and often there is little change to a depth of 3 feet. The subsoil varies considerably. The reason for this will be evident when we consider the method of its formation. Nearest the bluff it usually consists of a reddish-brown or yellow silty loam, but where it lies adjacent to the Yazoo clay the subsoil becomes much heavier. The following analyses show the texture of the Lintonia loam:

Mechanical analyses of Lintonia loam.

No.	Locality.	Description.	Organic matter.	Gravel, 2 to 1 mm.	Coarse sand, 1 to 0.5 mm.	Medium sand, 0.5 to 0.25 mm.	Fine sand, 0.25 to 0.1 mm.	Very fine sand, 0.1 to 0.05 mm.	Silt, 0.05 to 0.005 mm.	Clay, 0.005 to 0.0001 mm.
			P. ct.	*P. ct.*	*P. ct.*	*P. ct.*	*P. ct.*	*P. ct.*	*P. ct.*	*P. ct.*
7011	½ mile SW. of Caseyville.	Brown silty loam, 0 to 18 inches.	1.97	0.06	0.30	0.18	0.60	11.16	82.28	5.36
7012	Subsoil of 7011.....	Brownish-yellow silty loam, 18 to 36 inches.	1.90	.00	.22	.20	.36	10.38	81.32	7.52

The Lintonia loam occupies only a small percentage of the area. It occurs as a narrow band along the foot of the Mississippi River bluffs and extends up the small streams which flow out from them. It is broadest where these streams issue from the bluffs and have spread it out in fan-shaped deltas over the adjoining bottom lands. It rises gradually from the level of the bottoms as a gentle slope and is therefore usually well drained. Where it occurs along the streams it is subject to occasional overflow.

The position of the Lintonia loam suggests at once the method of its formation. It represents material which has been washed down from the bluffs during periods of rainfall. The water coming down from the hills is enabled by means of its high velocity to carry heavy loads of material, but when the more level land is reached the velocity is checked and the material carried in suspension is deposited. Each succeeding rainfall brings down its load of material, depositing it a little farther out than the last one. The area of the Lintonia loam is therefore being gradually extended. The material thus deposited is derived almost entirely from the loess formation, and therefore it is a fertile soil.

The Lintonia loam is easily cultivated and produces good yields of almost all the crops grown in the area. Corn, wheat, oats, hay, Irish potatoes, truck, and market-garden crops are all found in different parts of the area. When seen the corn was doing well and gave promise of a yield of 50 or more bushels to the acre. Some sweet corn was noticed, and the growing of more of this would no doubt prove profitable. The type is well adapted to the growing of Irish potatoes and yields of 200 bushels an acre are not uncommon. It should be used for the growing of Irish potatoes, green corn, pease, tomatoes, cabbage, and other truck and market-garden crops, for which there is a good market.

YAZOO LOAM.

The soil of the Yazoo loam is composed of a slightly sandy brown loam, having a depth of 14 inches. It is a heavier loam than the Lintonia loam, due to the larger amount of clay which it contains. It is fairly uniform, but contains more sand in some places than in others. It is an intermediate type between the Yazoo clay and the Yazoo sandy loam. The subsoil varies much more in texture than the soil. It often consists of two or more strata. The lower one, beginning at a depth of about 30 inches, is a fine loamy sand, similar to the surface soil of the Yazoo sandy loam. Between this and the soil is found a stratum of a yellowish silty and fine sandy loam. In a few instances, however, this middle layer was lacking and the soil rested directly upon the sand.

The mechanical analyses of Yazoo loam are given below:

Mechanical analyses of Yazoo loam.

No.	Locality.	Description.	Organic matter.	Gravel, 2 to 1 mm.	Coarse sand, 1 to 0.5 mm.	Medium sand, 0.5 to 0.25 mm.	Fine sand, 0.25 to 0.1 mm.	Very fine sand, 0.1 to 0.05 mm.	Silt, 0.05 to 0.005 mm.	Clay, 0.005 to 0.0001 mm.
			P. ct.	*P. ct.*	*P. ct.*	*P. ct.*	*P. ct.*	*P. ct.*	*P. ct.*	*P. ct.*
7001	¼ mile S. of Prairie du Pont.	Brown sandy loam, 0 to 14 inches.	3.94	0.08	0.18	0.12	1.84	23.10	58.70	16.08
7003	½ mile SE. of Cahokia.	Brown loam, 0 to 16 inches.	2.49	.00	.20	.36	30.14	13.16	35.52	20.42
7002	Subsoil of 7001.....	Loam with fine sand and silt, 14 to 36 inches.	1.76	.00	.56	.24	1.40	30.38	50.78	16.18

The largest areas of Yazoo loam are found south and southeast of Cahokia. Other smaller areas occur in the northeastern part of the American Bottoms. It generally occupies the higher lying areas or low, broad ridges. The surface is slightly rolling. As this soil is situated upon the higher lying lands, it is usually well drained. The underlying layer of sand also assists in giving to it a good underdrainage. It is not subject to overflow, except during the very highest floods, and there is very little danger from this source.

The Yazoo loam is an alluvial deposit, having been formed by the overflow of the Mississippi River during periods of very high water. The different layers were probably formed during different times of overflow. Wherever the swift current was checked suddenly, there it deposited its load of sand, the finer material settling in stiller water.

Corn and wheat form the principal crops grown on the Yazoo loam, and average yields of from 35 to 40 bushels of corn and from 15 to 18 bushels of wheat to the acre are obtained. The present season (1902) the average yield of wheat was considerably more than that given above. Irish potatoes, sweet corn, tomatoes, cabbage, and other similar crops are grown to a limited extent only. On account of the adaptability of the soil to these crops and the excellent market facilities, greater attention should be given to them.

AGRICULTURAL METHODS.

While a large number of the farms in St. Clair County are cultivated in accordance with the latest and most progressive ideas, still an improvement in the methods used could be made in many cases with profit to the owner. The practice of removing each year a large amount of plant food from the soil without any compensation in the use of manures always leads sooner or later to a deterioration in the

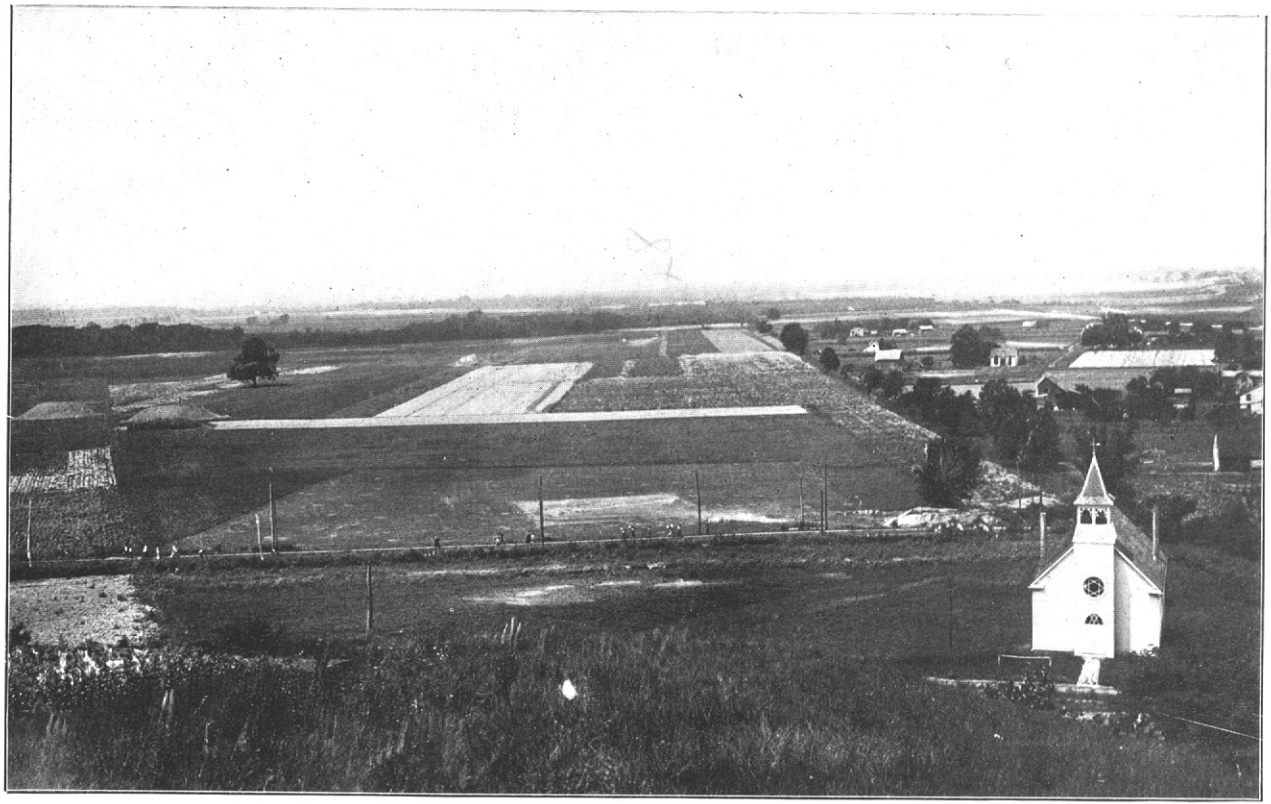
productiveness of the soil, although it may not be evident for a number of years. The methods followed for many years by a majority of the farmers of the area tended to bring about this result. Crop after crop was harvested and the fertility which these represented was hauled off the farm without any effort being made to replace it. The straw was burned to get it out of the way, and even the small amount of manure which was made was either burned with the straw or put in some gully to prevent washing. Such methods, however, have been abandoned by the more intelligent and progressive farmers, although many instances of thoughtless waste were noticed in all parts of the county. Commercial fertilizers are beginning to be used by some of the farmers. There is no doubt that they increase the yield and in some cases their use is to be recommended, but the fact that they enter a considerable item upon the expense side of the account should not be overlooked. The purchase of commercial fertilizers while at the same time the manure made upon the farm is allowed to go to waste is certainly not wise. Stable manure not only furnishes valuable plant food, but also improves the texture of the soil and assists in its capacity for the retention of moisture. Not only should more stock be raised and more manure be applied to the soil, but also the practice, which is followed by many farmers, of plowing under green crops, especially leguminous crops, such as cowpeas and clover, should be more generally followed. These plants furnish good forage for stock and at the same time improve the soil.

Experiments have shown that there are very few soils, however rich they may be, that will continue to produce the same crop every year without any diminution in the yields, and a rotation of crops therefore becomes necessary. The majority of farmers of St. Clair County have no regular system of rotation, while many of the fields are seeded to wheat continuously year after year, without giving the soil any change or rest. The rotation which seems to be most commonly practiced is to follow one year of clover with one or two years of corn, and then with four or five years of wheat. Oats are sometimes introduced into the rotation. A more systematic rotation and greater diversity in the crops has been introduced within the last few years, especially upon the Miami silt loam and Miami fine sandy loam.

In some years the rainfall during the summer season is not in sufficient quantity, or is too irregularly distributed, to produce a good crop of corn, and the question of conserving the moisture in the soil becomes a very important one. The corn should be cultivated as soon as possible after each heavy rain, so as to form a soil mulch to decrease the loss of moisture by evaporation. The usual method of "laying by" is to throw the soil up against the corn with a turning plow, thus not only cutting off the roots to a depth of 3 or 4 inches, but also exposing a larger soil surface to evaporation. An actual measurement

VIEW OF THE UPLANDS IN ST. CLAIR COUNTY, ILL.

The wheat growing on the Marion silt loam gives frequently an abundant crop of straw, but a poor yield of grain, on account of the hardpan cutting off the moisture below during the dry period which comes when the grain is maturing. This soil in other areas has been successfully used for apples.



VIEW OF THE AMERICAN BOTTOMS, ST. CLAIR COUNTY, ILL.

A perfectly level plain, at places 10 miles broad, producing magnificent farm crops on a variety of soils. Much of this land is still uncleared and awaiting settlement.

showed that in many cases 18 per cent more surface is exposed than would be the case if the soil were level. Small-toothed cultivators would undoubtedly waste less moisture, cut off fewer roots, and give better results. The working of organic matter into the soil by the use of manure and the plowing under of green crops will also aid in retaining moisture.

Gang plows and single walking plows are both in common use, but the disk plow is beginning to be used by many farmers. The ground is usually broken as soon as the wheat is taken off. Some farmers thrash the wheat from the shock, while others stack it before thrashing. The former method saves the expense of stacking, but the wheat is liable to be damaged from rains. The wheat is generally hauled to market from the thrasher. Corn was formerly cut by hand, but machinery is now being used quite extensively for this purpose. As soon as the corn becomes dry enough it is husked and cribbed and the cattle are allowed to eat the fodder. Shredders are now being used by many farmers. Little corn is shipped out of the county. Two different methods are practiced in the growing of Irish potatoes. The planting is the same in both cases, but in one method the potatoes are cultivated, while in the other the ridges are covered with a straw mulch as soon as the potatoes are planted and receive no cultivation. Some growers claim that the potatoes grown under a mulch are of a better quality than those which are cultivated in the usual way.

AGRICULTURAL CONDITIONS.

St. Clair County has always ranked as one of the leading agricultural counties in the southern part of the State. The farmers are generally prosperous, as is evidenced in the many well-kept farms. The improvements upon these differ in different parts of the area. They usually consist of a neat, well-built, painted dwelling house, a barn for stock and feed, and outhouses for other purposes. The majority of the farmers have binders, mowers, rakes, plows, and other farm implements, while some have corn harvesters and shredders. Many of them do not provide shelter for these implements, but allow them to remain out in the weather from one season to another.

About one-half of the land in the county is worked by tenants, the proportion being greater in some localities than in others. In the American Bottoms almost all of the land is owned by men who do not live upon it, and the improvements upon the farms here are below the average for the county. Two methods of renting the land are practiced. In one a certain price per acre is paid for the use of the land, the price usually ranging from $3 to $5 per acre, though in some cases, where two or three crops a year are obtained, the rent may be as much as $8 or $10 per acre. This system, while it is most common in the American Bottoms, is also usually followed where the renter

wishes to use the land for truck, market-garden crops, or pasture. Under the more common system, however, the tenant gives for the use of the land a fixed proportion of the crop, usually one-third, delivered at the market. This plan is generally considered to be more satisfactory both to landlord and tenant. In the average run of seasons full crops are only obtained about six years out of ten, and in seasons of poor crops it is often difficult for the tenant to pay a money rent. Some of these tenants were born and brought up upon the farms which they are now cultivating and look after them very carefully.

The farms of St. Clair County vary in size from a few acres to nearly 500 acres, but 80 acres will about represent the average size. Some men own many farms, so that the average amount to the landowner is above this figure. The farms were formerly much larger, but have gradually decreased in size. The smaller farms are more generally near Belleville and East St. Louis and along the electric railway which connects these two places. The land along this line is being rapidly taken up for suburban residences. The value of the land varies greatly in different parts of the county, due to the difference in the character of the soils, the amount of improvement upon it, its location, and the amount of coal under it. Unless near a railroad the last factor does not affect it very much. The better quality of the land, when well improved, sells at from $75 to $125 per acre, while the poor, unimproved tracts can be bought for $20 per acre. The largest areas of unimproved land lie along the Kaskaskia River and smaller streams and are still timbered. The value is higher near the towns or cities, and some of the land near East St. Louis could not be bought for less than $300 per acre.

The farm laborers are almost exclusively white. Labor is generally scarce, although some farmers say they have little difficulty in obtaining hands. The greatest scarcity is felt at the time of harvesting and thrashing the wheat crop, and considerable loss is sometimes sustained by reason of a lack of labor to harvest it at the proper time. Farm laborers are usually paid from $15 to $20 per month, and are given board and washing in addition. The labor is efficient, and the only difficulty is in getting enough of it.

Wheat, corn, oats, Irish potatoes, orchard fruits, truck, and market-garden crops are the principal agricultural products grown in St. Clair County. Of these wheat is by far the most important, as probably two-thirds of the cultivated land is seeded every year to this crop, while on the Marion silt loam it forms almost the exclusive crop. St. Clair County ranks first among the counties of the State in the number of acres planted in wheat. The wheat produced is of an excellent quality. A greater diversity of crops has been introduced upon the Miami silt loam and Miami fine sandy loam within the last few years, and the acreage in wheat upon these types has been reduced.

Corn is the crop next in importance to wheat. Very little of it is grown upon the Marion silt loam, as this type of soil is not adapted to it. Oats are grown to some extent, but are generally considered to be an uncertain crop, although some farmers obtain good yields. Since the time of the early settlers Irish potatoes have formed one of the important agricultural products of the county. Large areas, especially in the Mississippi Bottom, are planted in this crop each year, and profitable returns are obtained. Some farmers report as high as 400 bushels to the acre, but such yields are rare and the average is probably less than 75 bushels per acre. Nearly every farmer has a small orchard to furnish fruit for domestic use, but in a commercial sense fruit growing in St. Clair County is in its infancy. This should not be the case, however, as there are large areas along the bluffs and on the hills which are best suited to the production of fruits and where well-cared-for orchards would be very profitable. There is a considerable amount of trucking and market gardening carried on, especially near Belleville and East St. Louis. Cabbages, tomatoes, sweet corn, strawberries, raspberries, and blackberries are grown in considerable quantities and are readily disposed of in the near-by markets. There are still large areas of soil in the county which could be made to yield much larger profits from these crops than are obtained from the crops now grown.

While there has been no attempt heretofore to classify the soils of St. Clair County and to show the areas occupied by each type, a broad classification has been recognized by the farmers and a general adaptation of the crops to the different soil types has been worked out. Experience has shown that the growing of corn is not profitable upon the Marion silt loam, and that wheat does better than any other grain. The possibilities of this soil for the production of fruit has not been recognized, although some fair orchards were noticed upon it. The Yazoo sandy loam is recognized by the growers of early vegetables to be adapted to these crops. Many farmers, however, still grow wheat and corn upon this type. These would undoubtedly find truck and market-garden crops much more profitable. A few instances were noticed where attempts were being made to grow truck crops upon the Yazoo clay, but the condition of the plants did not give promise of very profitable returns.

The development and prosperity of any community depends largely upon its means of communication with other parts of the country. The Mississippi River has always furnished a natural highway into the heart of the United States and has had a great influence upon the development of the country adjacent to it. This influence was much more potent before the building of so many lines of railway. A large proportion, however, of the coal, of the manufactures, and agricultural products of St. Clair County is still carried to market by means of

barges and steamboats plying this river. Nearly all the great trunk lines of the East and South run into the county and have their termini at East St. Louis, thus furnishing transportation facilities enjoyed by very few counties in the country. The lines which have the greatest mileage in the area are the Baltimore and Ohio Southwestern, which runs east and west through the northern part; the Southern Railway and the Louisville and Nashville, which traverse the central part; and the Illinois Central, which crosses from southeast to northwest. These connect at East St. Louis with all the great lines from the North and West. Electric lines also connect Belleville, East St. Louis, and Caseyville. The first two places are also joined by a good macadamized road—the first one built in the State. Turnpike roads radiate from Belleville in all directions and the entire county is traversed by fair dirt roads. These many excellent systems of transportation give to the farmers of St. Clair County ready communication with all the great markets of the country. The farmers' greatest advantage, however, lies in the heavy local demand for their products. The great city of St. Louis, which is situated directly across the river, consumes each year large quantities of agricultural products. East St. Louis, with a population of over 30,000, and Belleville, with about 20,000, as well as a number of other smaller towns of from 500 to 2,500 inhabitants, also furnish good home markets for the products of the farm.

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