STATE OF ILLINOIS
DEPARTMENT OF REGISTRATION AND EDUCATION
DIVISION OF THE
STATE GEOLOGICAL SURVEY
M. M. LEIGHTON, *Chief*

REPORT OF INVESTIGATIONS—NO. 30

OIL AND GAS POSSIBILITIES OF PARTS OF JERSEY, GREENE, AND MADISON COUNTIES

By
D. M. COLLINGWOOD

With
Appended Well Records
compiled and correlated by
GEORGE E. EKBLAW and L. E. WORKMAN

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Letter of Transmittal

JOHN J. HALLIHAN, *Director, and Members of the Board of Natural Resources and Conservation*

GENTLEMEN:

I have the honor of transmitting herewith a report on "Oil and Gas Possibilities in Parts of Jersey, Greene, and Madison Counties," by D. M. Collingwood which is to be printed as Report of Investigations No. 30. The field investigations were made by the author during the field seasons of 1922 and 1923 following which he resigned from the Survey to accept a position in the Mid-continent oil field. The present report also incorporates subsurface information obtained in refined studies of well cuttings, and also some detailed field data secured since the original work was done. Because this report will be valuable to all who are interested in the oil and gas possibilities of this particular area, its publication is recommended.

Very respectfully,

M. M. LEIGHTON, *Chief.*

December 17, 1932.

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OIL AND GAS POSSIBILITIES OF PARTS OF JERSEY, GREENE, AND MADISON COUNTIES

By

D. M. Collingwood

ABSTRACT

The report describes the stratigraphic and structural geology and discusses the oil possibilities of an area of 700 square miles in Greene, Jersey, and Madison counties, Illinois. Two major structures and several minor structures exist in this area. One of the major structures—the Pittsfield-Hadley anticline in northern Greene County—is recommended for testing for oil and gas (p. 40). The minor structures are not recommended for testing unless production or favorable showings of oil or gas are found on the major structure and in that case shallow test-drilling to establish closure should precede deeper testing for oil and gas. An appendix gives detailed well records for the area described and for some of the surrounding region.

CHAPTER I—INTRODUCTION

For a number of years production of oil in Illinois has been decreasing. The main oil fields—in the southeast part of the State—are gradually being exhausted, and unless new fields are opened or improved methods of recovery are adopted, production will continue to decline. It is probable that no new fields as large or as prolific as those in Crawford and Lawrence counties will be discovered in Illinois, but many small productive areas have been found already in the south, west-central, and west parts of the state, and others doubtless await discovery. The discovery of oil at shallow depth in the Kimmswick ("Trenton") formation at Waterloo,[1] south of East St. Louis, in 1920 and at Dupo[2] in 1928 strengthens such belief.

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[1] Geology and oil and gas possiilities in the vicinity of Waterloo, Monroe County: Illinois State Geol. Survey Press Bulletin, April, 1920.

Mylius. L. A., Oil and gas in Monroe County, Illinois: Illinois State Geol. Survey Press Bulletin, February 10, 1921.

Mylius, L. A., Oil possibilities of the Posten School structure, Monroe County, Illinois: Illinois State Geol. Survey Press Bulletin, November 19, 1921.

Lamar, J. E., Notes on the Waterloo anticline: Illinois State Geol. Survey Press Bulletin, 1922. (Reprinted from Trans. Illinois State Acad. Sci., Vol. 15.)

[2] Bell, A. H., The Dupo oil field: Illinois State Geol. Survey Illinois Petroleum No. 17, March 2, 1929.

FIG. 1—Map of Illinois showing the Jersey-Greene area.

Location and General Description

The area covered by this report consists of 700 square miles lying east of Illinois River and north of Mississippi River and comprising the western parts of Jersey and Greene counties and an adjacent part of Madison County (Fig. 1). Piasa Creek in Jersey County, Macoupin Creek near the Greene-Jersey county-line, and Apple Creek in central Greene County are the principal streams. The physiography of the area is of three main types—(1) the broad, open valleys of Mississippi and Illinois rivers, (2) the dissected bluff country bordering these rivers, and (3) the level or gently undulatory uplands with broad, shallow valleys. The total relief is about 250 feet.

Acknowledgments

The field work on which this report is primarily based was a careful reconnaissance study made during the summers of 1922 and 1923. Mr. Towner B. Root served as assistant geologist during the greater part of both seasons. Mr. R. C. Quinlevan and Mr. John T. Stewart served as instrumentman and rodman, respectively, during the first season and Mr. W. E. Dickie and Mr. T. W. Vayo as instrumentman and rodman during the second season. Mr. Frank Krey participated in helpful conferences in the field and office and some of his work[3] has been used in this report.

Since the field work was completed, more detailed geologic studies carried on by Mr. J. R. VanPelt in the Roodhouse, Brighton, and Alton quadrangles and by Mr. W. W. Rubey in the Hardin and Brussels quadrangles, records of additional wells, and studies of available samples of well cuttings in and near the area have provided additional data.

Dr. A. H. Bell, geologist now in charge of the petroleum division of the Survey, has incorporated these data in the report and has checked the locations and elevations of outcrops and the structural contours against the original data. The revised manuscript has been further checked by Dr. George E. Ekblaw, geologist in charge of the areal geology division and geologic editor, who has also compiled for the appendix the records of all wells in the area covered by the report and of important deep wells in adjacent areas as correlated by himself and Mr. L. E. Workman, associate geologist in charge of subsurface studies. These records provide the data according to which the structure was determined where no other data are available and also provide the bases for the statements regarding thicknesses of formations elsewhere than in the area.

In the original field work, United States Post Office Department county maps, scale one mile to the inch, were used as base maps. Since then the

[3] Krey, Frank, Structural reconnaissance of the Mississippi Valley area from Old Monroe, Missouri, to Nauvoo, Illinois: Illinois State Geol. Survey Bull. 45, 1924.

entire area has been sketched topographically and quadrangle maps have been issued by the United States Geological Survey. The quadrangle maps have been used as the base for the structure map (Plate I), and the datum points and structure contours on it have been transcribed from the original base by Drs. Bell and Ekblaw.

Geologic Summary

The area is covered by glacial drift, under which bedrock strata ranging in age from the Kimmswick formation of the Ordovician system to the McLeansboro group of the Pennsylvanian system successively crop out from the southwest to northeast in accordance with their regional northeasterly dip. Only those formations older than the Pennsylvanian system and exposed or encountered in wells in the area are considered in this report.

Within the area are two major anticlines, the Lincoln fold in southwest Jersey County and the extension of the Pittsfield-Hadley anticline in northwest Greene County. The Lincoln structure offers slight possibility for oil because the Kimmswick formation crops out on its crest, and no other petroliferous formation is to be expected beneath it. On the Pittsfield-Hadley anticline, however, the Kimmswick-Plattin ("Trenton") has not been tested in Greene County and has possibilities of oil production. The Devonian-Silurian ("Niagaran") formations have not been thoroughly tested and might prove productive. Several minor anticlines and structures (Plate I) would be considered favorable if the major structures prove productive.

CHAPTER II—DESCRIPTIVE GEOLOGY

ORDOVICIAN SYSTEM

CHAZYAN SERIES

ST. PETER FORMATION

The St. Peter sandstone, which is penetrated by wells but not exposed, is the oldest formation actually known in the Jersey-Greene area. Throughout western Illinois, as far south as Jerseyville, it is a common source of fresh water, but in the central and southern parts of the State, where it lies at greater depths, it carries salt water.

CHAZYAN AND MOHAWKIAN SERIES

JOACHIM-PLATTIN-KIMMSWICK FORMATIONS

A series of limestones not always distinguishable in well logs but comprising, in ascending order, the Joachim, Plattin, and Kimmswick formations, overlies the St. Peter sandstone in the "Jersey-Greene" area.[1] It is correlative with the "Trenton" limestone from which oil is produced in eastern Indiana and western Ohio. The oil in the Waterloo and Dupo fields in southwestern Illinois is obtained from the Kimmswick formation.

Of the three formations the Kimmswick alone crops out in the Jersey-Greene area, 25 feet of it being exposed in the Illinois River bluffs in southwest Jersey County along the crest of the Lincoln fold. It is a gray limestone, in some places faintly pinkish or flesh-colored, coarsely granular and porous where the beds are thick, and finely granular where locally thin-bedded.

The Plattin[2] limestone, as exposed in outcrops in Calhoun County, Illinois, and in Missouri, varies in texture from granular to lithographic. The upper part is thin-bedded with bituminous shaly partings. The Joachim formation is a massive dolomite, gray or yellow when fresh and brown when weathered.

Northwest of St. Louis (log No. 65) the Plattin-Kimmswick-Joachim-series is 430 feet thick. At Jerseyville, 387 feet of "Trenton" is recorded

[1] For convenience and brevity the area covered by this report is referred to as the "Jersey-Greene" area.

[2] For detailed descriptions of the Plattin and Joachim see Krey, Frank, Structural reconnaissance of the Mississippi valley area from Old Monroe, Missouri, to Nauvoo, Illinois; Illinois State Geol. Survey Bull. 45, pp. 19-21, 1924.

TABLE 1.—*Geologic strata and the known range of their thicknesses in Jersey and Greene counties*

System, series, group, and formation	JERSEY COUNTY								GREENE COUNTY							
	West		Central		South		Northeast and East		Southwest		Southeast		Northwest		Northeast	
	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.
Pleistocene	0	120	0	100±	0	100+	0	100±	0	100+	0	100	0	100+	0	150
Pennsylvanian	—	—	0	80	0	25+	0	300±	0	40+	0	170	0	70	40	200
Mississippian																
Chester series	—	—	—	—	—	—	—	—	—	—	0	50	—	—	—	—
Iowa series																
Meramec group																
Ste. Genevieve	—	—	—	—	—	—	0	50?	—	—	—	—	—	—	—	—
St. Louis	—	—	—	—	—	—	0	100?	—	—	0	150?	—	—	0	50
Osage group (Salem, Warsaw)	—	—	0	120	0	120	40	160?	0	115	0	160	0	30	0	160
Keokuk-Burlington	0	240	245	270?	0	290	250±	275±	0	250	220	250	0	275	200	275
Fern Glen	—	—	0	30	0	60	0	50	Not recognized							
Kinderhook group																
Chouteau	0	50	25	50	0	45	0	50±	0	25	—	—	—	—	—	—
Hannibal	0	40	25	125	0	90	25	40	60	105	100	135	105	150	115	148
Louisiana	0	8	8	10	—	—	—	—	—	—	—	—	—	—	—	—
Sweetland Creek	—	—	0	10	0	30	0	20?	30	95	40	45	0	50	35	55
Devonian																
Senecan series																
Cedar Valley?	0	50?	15	75	0	30	75−	75+								
Silurian																
Niagaran series	0	?							50±	230	200±	300±	45	190	200±	300±
Alexandrian series																
Sexton Creek	0	9	100	160	0	105	160	225?								
Edgewood	0	60														
Ordovician																
Cincinnatian series																
Maquoketa group	100	150	140	165	40?	170	150	175	160±	180±	175±	200±	100	205	100±	180±
Mohawkian series																
Kimmswick, Plattin																
Chazyan series, Joachim	380−	380+	380−	390+	335	400	380−	390+	300+	400±	300±	400±	300+	430+	300±	400±

(log No. 43), and at Carrollton 335 feet (log No. 30). To the east the thickness increases slightly, being more than 370 feet near Carlinville in Macoupin County.

CINCINNATIAN SERIES

MAQUOKETA GROUP

The Maquoketa shale crops out in the Jersey-Greene area only where the Lincoln fold crosses southwest Jersey County. It is exposed in the lower parts of ravines that cut into the bluffs near and west of Grafton, as Mason Hollow in the SE. ¼ sec. 9, T. 6 N., R. 12 W., Dagett Hollow in the SW. ¼ sec. 9, T. 6 N., R. 12 W., and Graham Hollow in the NE. ¼ SW. ¼ sec. 1, T. 6 N., R. 13 W.

It is a dark gray-green, thinly laminated shale, usually siliceous but locally some beds are slightly calcareous. It carries disseminated organic matter in its darker beds and is a possible source of oil.

The shale thickens to the north and east (Table 1). It thickens from 140 feet northwest of St. Louis (log No. 65), to 148 feet near Grafton (log No. 49), 165 feet at Jerseyville (log No. 43), 172 feet at Carrollton (log No. 30), and 186 feet in Scott County (log No. 1).

SILURIAN SYSTEM

ALEXANDRIAN SERIES

EDGEWOOD (BOWLING GREEN) FORMATION

The Edgewood formation forms the north bluff of Mississippi Valley from sec. 12, T. 6 N., R. 13 W., three miles west of Grafton, to the Illinois Powder Company's plant about a mile east of the town and also crops out in the Illinois River bluff on the north flank of the Lincoln fold from its axis for about a mile beyond Rosedale, dipping beneath younger rocks to the north and east.

It is a buff-gray, massive, porous dolomite which weathers to yellow or light brown. The numerous pores, some of which are as large as a pin head, may be iron-stained and usually bear black dendritic markings, even in fresh rock. Silurian formations older than the Edgewood, not outcropping in this area, may be present farther to the south and east.

SEXTON CREEK FORMATION

Limestone overlying the Edgewood formation in the NW. ¼ sec. 4 and near the center of sec. 22, T. 7 N., R. 13 W. (Geologic section No. 3, p. 15), and cropping out elsewhere (Geologic section 1), is correlated with the Sexton Creek formation.[3]

[3]Key, Frank, Structural reconnaissance of the Mississippi Valley area from Old Monroe, Missouri, to Nauvoo, Illinois; Illinois State Geol. Survey Bull. 45, pp. 27-28, 1924.

Geologic Section No. 1—*Strata exposed in ravine across W. ½ sec. 28 and E. side sec. 29, T. 8 N., R. 13 W., Jersey County*

	Thickness Feet	Inches
Mississippian system		
Iowa series		
Kinderhook group		
Limestone, dark gray, hard, brittle, "slaty", thin-bedded (beds about ½ inch thick)		
Louisiana formation		
Limestone, dull, yellow-brown, massive, lithographic, conchoidal fracture	4	
Sweetland Creek formation (?)		
Covered, probably shale	2	
Devonian system, undifferentiated		
Senecan series		
Sandstone, calcareous, sugary texture, very fossiliferous	1	6
Limestone, sandy, brown to brown-and-white speckled, granular and sugary, medium fine-grained, fossiliferous	1	6
Limestone, as above, somewhat sandy in places	2	
Limestone, dolomitic, massive, fine-grained to earthy, much weathered; occasional crystals in dull, earthy fractured surface	3	
Silurian system		
Alexandrian series		
Sexton Creek formation		
Limestone, light blue-gray, lithographic, much fractured	2	
Limestone, as above; contains small calcite stringers; grades into bed below	3	
Limestone, dark gray, finely crystalline to brecciated, dense and dull, hard, contains much calcite and shale ramifications	2	

It is gray, crystalline, compact, generally in thick, massive beds, has a flaky fracture, and contains small ramifying stringers of green shaly material. Locally it is thin-bedded, granular, darker, cherty, or almost lithographic. Exposed surfaces are usually knobby owing to weathering of the shaly stringers. The formation thickens to the west, but is probably not present very much farther to the north, east, or south.

Devonian System

The Devonian system in the Jersey-Greene area is represented by only a few feet of Upper Devonian strata which are exposed in several places in and near Grafton and along the bluffs near Rosedale and Nutwood. The beds consist of yellow, earthy, argillaceous, dolomitic limestone, sandy limestone, and quarzitic sandstone (Geologic sections 1-7). Where the sandy phase is preserved in granular form, the rocks are quite porous, but in many places cementation and secondary crystal growth have destroyed much of the original porosity.

Geologic Section No. 2—*Strata exposed at the middle of the S. line of sec. 33, T. 8 N., R. 13 W., Jersey County*

	Thickness Feet	Inches
Devonian system		
Senecan series		
Sandstone, soft to hard, quartzitic at base		8–10
Limestone, yellow, coarsely granular	2	6

Geologic Section No. 3—*Strata exposed in the SE. corner NW. ¼ sec. 22, T. 7 N., R. 13 W., Jersey County*

Devonian system		
Senecan series		
Limestone, buff colored, coarsely granular above, grading below into limestone, dolomitic, yellow, massive, finely granular, earthy	15	
Silurian system		
Alexandrian series		
Sexton Creek formation		
Limestone	1	6
Covered	9	6
Edgewood (Bowling Green) formation		
Limestone (outcrop in road)		

Geologic Section No. 4—*Strata exposed in the NW. corner NW. ¼ sec. 4, T. 7 N., R. 13 W., Jersey County*

Devonian system		
Senecan series		
Limestone, brown, coarsely granular, very fossiliferous, grading below into limestone, dolomitic, yellow, massive, fine-grained, earthy	13	

Geologic Section No. 5—*Strata exposed in the SE. corner NW. ¼ sec. 10, T. 6 N., R. 12 W., Jersey County*

(See Geologic Section No. 11)

Mississippian system		
Iowa series		
Kinderhook group		
Sweetland Creek formation		
Shale, dark blue-gray		
Devonian system		
Sandstone, quartzitic, dark blue-gray		2
Sandstone, calcareous, dark gray, fine-grained, somewhat earthy, sparingly fossiliferous		8
Covered	2	6
Limestone, dolomitic, yellow to brown, finely crystalline to earthy, no fossils seen		6
Limestone, sandy or gritty with fine silt, gray to brown, finely granular, lower 3 feet more sandy than upper part, top 6 inches fossiliferous	5	
Silurian system		
Alexandrian series		
Edgewood formation		
Limestone, dolomitic, hard, porous		

Geologic Section No. 6—*Strata exposed in Mason Hollow in the SE. ¼ SE. ¼ sec. 4, T. 6 N., R. 12 W., Jersey County*
(See Geologic Section No. 12)

	Thickness Feet	Inches
Mississippian system		
Iowa series		
Kinderhook group		
Sweetland Creek formation		
Shale, black to dark gray, hard, thinly laminated....	5	
Shale, dark blue-gray, chunky or platy in ½ inch beds with local irregular, green clay partings.....	3	
Devonian system		
Senecan series		
Sandstone, white, fairly coarse-grained, containing pyrite segregations.....		4
Limestone, siliceous or silty, gray, fossiliferous above, grading below into sandstone, calcareous, silty, yellow, fine-grained.....	6	6
Silurian system		
Alexandrian series		
Edgewood formation		
Limestone, dolomitic, light buff to gray, porous.....		

Geologic Section No. 7—*Strata exposed in the town of Grafton, Jersey County*

Devonian system		
Senecan series		
Limestone, sandy, fossiliferous, grading into sandstone, calcareous, brown.....		6–12
Limestone, dolomitic, earthy, siliceous grading into limestone, silty or quartzitic or into sandstone..	5	6
Sandstone, calcareous, brown, fossiliferous, with earthy calcareous inclusions resembling funiculoids		8

The sand in the strata suggests that they are littoral deposits and therefore mark a zone not far from the shore lines of the Devonian sea. No Devonian rocks are recorded immediately northwest of St. Louis, but a record of a well north of St. Louis (log No. 64) shows 10 feet of strata possibly of Devonian age, and at Carrollton, 19 feet of hard or soft, dolomitic, earthy to granular limestone, comparable to the Devonian exposures in southern Jersey County, was penetrated below the Sweetland Creek (Mississippian) shale (log No. 11). Apparently Devonian strata persist and thicken to the northwest and east but do not extend far either to the north or south.

Devonian-Silurian Systems, Undifferentiated

It is usually impossible to differentiate the Devonian and the Silurian limestones in well logs and it is not always possible to do so even from samples of well cuttings. Drillers usually refer to the combined formations extending from the overlying Kinderhook shale to the underlying Maquoketa shale as the "Niagara" formation. The combination is 110-130 feet thick near Grafton (logs Nos. 49, 52, and 53), about 160 feet thick in western

Macoupin County, and 336 feet in central Madison County (log No. 57) where the Silurian strata are much thicker.

Although the "Niagara" formation often contains fresh water at shallow depths, it carries salt water at greater depths and in western Illinois it has yielded salt water in wells no deeper than 375 feet. It is the reservoir rock of the gas field in Pike County, Illinois, on the Pittsfield-Hadley anticline. The porous strata in the Devonian formations and their capping of impervious Sweetland Creek or Kinderhook shale make them interesting as a possible reservoir horizon for oil and gas. Some shows of oil have been found just below the Sweetland Creek shale in drill holes in the southeast corner of Morgan County.

Mississippian System

GENERAL STATEMENT

All of the Iowa (Lower Mississippian) series (Table 2) is present in the Jersey-Greene area and crops out along the bluffs of Illinois River or in the ravines of its tributaries.

Table 2.—*Subdivisions of the Mississippian system in the Jersey-Greene Area*

Meramec group	Ste. Genevieve limestone
	St. Louis limestone
	Salem (?) limestone
Osage group	Warsaw shale
	Keokuk limestone
	Burlington limestone
	Fern Glen limestone
Kinderhook group	Chouteau limestone
	Hannibal shale
	Louisiana limestone
	Sweetland Creek shale

The St. Louis and Ste. Genevieve limestones also crop out in the Mississippi River bluffs at Alton and the Salem-Warsaw and Keokuk-Burlington formations crop out locally in a wide belt extending slightly west of north across Jersey and Greene counties. All of these formations persist under the Pennsylvanian rocks as they dip to the east, but the Fern Glen formation of the Osage group and the Kinderhook formations, which vary locally in thickness and extent, are not so regularly persistent to the east (Table 1, p. 12).

KINDERHOOK GROUP

The formations of the Kinderhook group can not always be differentiated in records of wells, so that for some localities only the thickness of the entire group is known. It thickens to the north and east, being 150 feet thick at White Hall (log No. 16), 175 feet thick in the southwest corner of Scott County (log No. 6), 170 feet thick in central Macoupin County, but only 55 feet thick at Alton (log No. 56).

SWEETLAND CREEK FORMATION

Sweetland Creek shale is exposed in the Jersey-Greene area only in Mason Hollow, where about 5 feet of it crops out (Geological Section No. 6, p. 16). In an excavation for one of the buildings at the Illinois Powder Company's plant east of Grafton, a few feet of shale, believed to be Sweetland Creek, was encountered. The two-foot covered interval above the Devonian sandy limestone near the center of the W. ½ sec. 28, T. 8 N., R. 13 W., (Geologic section No. 1, p. 14) probably represents Sweetland Creek shale.

The Sweetland Creek shale is dark gray or black to chocolate-colored and contains large amounts of resistant plant detritus—spores, spore exines, and resinous particles. It is identified in drill cuttings by its color and the presence of *Sporangites huronense.*

Drill records show that the shale thickens to the north and east. At Jerseyville it is possibly 10 feet (log No. 43); at Carrollton 43 feet (log No. 31) and 95 feet (log No. 30) (probably erroneously logged), and in central Macoupin County 87 feet. The formation is regarded as a probable source bed for oil because it contains large amounts of plant material.

LOUISIANA FORMATION

The Louisiana limestone, which overlies the Sweetland Creek shale or, where that member is absent, the Devonian sandy limestone, crops out beneath Hannibal shale at several places along the Illinois River bluffs and in ravines in western Jersey County.

It is yellow, thin-bedded to massive, siliceous, earthy to lithographic, with conchoidal fracture (geologic section Nos. 1, p. 14, and 8, p. 19). The formation is not present, however, in southern Jersey County.

The formation is thicker west in Calhoun County and northwest in Missouri. Ten feet of limestone at a depth of 555 feet at Jerseyville (log No. 43) may be Louisiana limestone. In deep drill holes east of the Jersey-Greene area a limestone which is sometimes found between a gray shale and a black shale in the Kinderhook group may be the Louisiana and if so the formation must extend east in a narrow belt through Jersey County, possibly to Macoupin County, but it does not extend north into Greene or south into southern Jersey or Madison counties.

HANNIBAL FORMATION

Exposures of 25 to 50 feet of Hannibal shale occur in the ravines transecting the river bluffs from Grafton to Nutwood. About a mile north of Nutwood the shale occurs at the base of the bluffs, the low undulatory topography which is developed on it being in marked contrast with the limestone bluffs on either hand. The shale is green-gray in color, soft, poorly laminated, and contains calcareous or sandy horizons.

Geologic Section No. 8—*Strata exposed in the SW. ¼ SE. ¼ sec. 33, T. 8 N., R. 13 W., Jersey County*

	Thickness Feet	Inches
Mississippian system		
Iowa series		
Kinderhook group		
Hannibal formation		
Covered (probably shale)	44	
Shale, blue-gray to green-gray, soft, poorly laminated; a 2-foot slightly calcareous zone occurs about 8 feet from the top; bottom 2 feet is calcareous and weathers yellow	27	6
Louisiana formation		
Limestone, argillaceous, grades upward to dark blue-gray, calcareous shale and downward into blue-gray, siliceous, thin-bedded, platy limestone	6	6
Limestone, yellow, lithographic	1+	

Geologic Section No. 9.—*Strata in the W. ½ sec. 11, T. 6 N., R. 12 W., Jersey County*

Mississippian system		
Iowa series		
Osage group		
Burlington formation		
Limestone, semi-dolomitic, brown-stained, crinoidal	3	
Kinderhook group		
Chouteau formation		
Limestone, gray, mottled with calcite flakes; weathers knobby; contains chert nodules	44	
Hannibal formation		
Shale, blue-gray to green-gray, soft, poorly laminated	48	
Devonian system		
Senecan series		
Sandstone		4
Limestone, earthy, soft	4	8
Silurian system		
Alexandrian series		
Edgewood formation		
Limestone, dolomitic, hard		

About 30 feet of shale is exposed in an old quarry in the SE. ¼ NW. ¼ sec. 10, T. 6 N., R. 12 W., (see Geologic sections Nos. 5, p. 15, and 11, p. 20). In the Illinois Powder Company's well east of Grafton there is 35 feet of Hannibal (and Sweetland Creek?) shale (log No. 51); in the Tidball well in the NW. ¼ sec 26, T. 7 N., R. 12 W., 88 feet (log No. 46); at Carrollton, 133 feet (log No. 31); and in southwest Scott County, 130 feet (log No. 6). These and other drill records show that the shale thickens to the north and possibly also to the northeast.

The Hannibal shale is a possible source of oil, but it contains little organic material from which petroleum could be derived. It would be an excellent caprock for any suitably disposed reservoir rocks below it.

CHOUTEAU FORMATION

The Chouteau formation is present above the Hannibal shale in most of the ravines tributary to Illinois River from a point two miles west of Grafton to six miles north of the Jersey-Greene county line.

Most of the formation is a hard, gray, thin-bedded, somewhat earthy and usually dense limestone, speckled when fresh owing to small flakes of calcite scattered through the dull-gray groundmass. It weathers knobby owing to removal of irregularly distributed argillaceous material and retention of more resistant cores, knobs, and chert nodules. Small calcite geodes are found in the softer beds. The upper part of the formation is slightly granular, often brown-stained, possibly dolomitic, and locally contains thin lithographic beds.

The Chouteau formation is apparently conformable with although distinct from the Hannibal shale. It is unconformably overlain by the Fern Glen formation where that formation is present. Where the Fern Glen is absent, there is a 5- to 10-foot transitional zone between semi-granular Chouteau limestone and dolomitic, somewhat earthy but granular Burlington limestone.

At most places the transitional beds weather more rapidly than those above and below it, creating a re-entrant in the bluff face. At other places the transitional zone is represented by talus marking a less steep face of the bluff. Oölitic beds are locally developed in the 6-foot transition zone exposed in the SW. ¼ NE. ¼ sec. 11, T. 7 N., R. 13 W.

Geologic Section No. 10—*Strata in the SE. ¼ NW. ¼ sec 1, T. 6 N., R. 13 W., in Graham Hollow, Jersey County*

(See Geologic Section No. 14)

	Thickness Feet	Inches
Mississippian system		
Iowa series		
Kinderhook group		
Chouteau formation		
Limestone, gray, hard, mostly semi-lithographic, thin-bedded		4
Limestone, gray, medium-hard, mostly dense and earthy, speckled with calcite flakes; beds subgranular; weathered surfaces knobby; chert nodules irregularly distributed	46	

Geologic Section No. 11—*Strata in the SE. ¼ NW. ¼ sec 10, T. 6 N., R. 12 W., Jersey County*

(See Geologic Section No. 5)

Mississippian system	
Iowa series	
Kinderhook group	
Chouteau formation	
Limestone, cherty near top, a 2-inch bed of lithographic limestone also near top	47

Geologic Section No. 12—*Strata in the ravine bluffs in Mason Hollow, E. ½ SE. ¼ sec. 4, T. 6 N., R. 12 W., Jersey County*

(See Geologic Section No. 6)

	Thickness Feet	Inches
Mississippian system		
Iowa series		
Osage group		
Burlington formation		
Limestone, white to cream-colored, massive to thin-bedded, coarsely granular, crinoidal; grades down into limestone, semi-dolomitic, yellowish, earthy, thin-bedded	6±	
Kinderhook group		
Chouteau formation		
Limestone, semi-dolomitic, light yellow, thin-bedded, contains occasional calcite crystals in dull yellow earthy groundmass (transition zone)	5	5
Limestone, lithographic, thinly and irregularly bedded		6±
Limestone, gray, dense, earthy, medium hard; calcite flakes in drab groundmass		

Geologic Section No. 13—*Strata in bluff in the SW. ¼ NE. ¼ sec. 3, T. 8 N., R. 13 W., Jersey County*

Mississippian system		
Iowa series		
Osage group		
Burlington formation		
Limestone, white to cream-colored and gray, coarsely granular, crinoidal	4+	
Limestone, coarsely granular beds as above, interbedded with partly weathered, earthy, buff-colored beds, probably dolomitic	6	6
Kinderhook group		
Chouteau formation		
Limestone, predominantly earthy, ranging from pale yellow in upper part to light brown in lower part, some weathered beds in lower portion contain calcite crystals (transition zone)	2	6
Limestone, gray, medium-hard, dense, earthy, thin-bedded, speckled with calcite flakes	4+	

Geologic Section No. 14—*Strata in the NE. ¼ NW. ¼ sec. 1, T. 6 N., R. 13 W., Jersey County*

(See Geologic Section No. 10)

Mississippian system		
Iowa series		
Osage group		
Burlington formation		
Limestone, partly dolomitic, buff-colored, massive	8+	
Fern Glen formation		
Shale		10
Chert and limestone, light gray, fine-grained to earthy		6
Kinderhook group		
Chouteau formation		
Limestone, light blue-gray, mostly lithographic, thin-bedded, weathers knobby	4	6

Twenty-eight feet of Chouteau limestone, with the usual upper transition zone of about 5 to 10 feet, is exposed in the bluffs of the small ravines in the SE. ¼ sec. 2, and the middle of the E. ½ sec. 3, T. 7 N., R 13 W.

The Chouteau limestone is 50 or more feet thick in southern Jersey County. It decreases in thickness to the north, being only about 25 feet thick at the Jersey-Greene county-line. It dips below the river flats about six miles north of the county line and probably does not continue much beyond that point as it is absent at Carrollton (logs Nos. 30, 31). Neither does it probably extend farther east than central Macoupin County where 25 feet of limestone at a depth of 1225 feet may be either Chouteau or Fern Glen, nor is it definitely recognized to the south, but it thickens to the west and southwest in Missouri.

OSAGE GROUP

FERN GLEN FORMATION

The Fern Glen formation consists of interbedded red and green limestones and shales which lie unconformably on the Chouteau limestone or Hannibal shale. It is best exposed in the Jersey-Greene area at the foot of the bluffs at Chautauqua, Jersey County, as follows:

Geologic Section No. 15—*Strata at the foot of the west bluffs of ravine, center of the N. ½ of the SE. ¼ sec. 13, T. 6 N., R. 12 W., Jersey County*

	Thickness Feet	Inches
Mississippian system		
Iowa series		
Osage group		
Burlington formation		
Limestone, white, hard, coarsely granular, crinoidal..		
Fern Glen formation		
Limestone, shaly, and shale, green to yellow, interbedded with some chert, more green shale in lower part.....	30	
Limestone, slightly yellow, hard, massive, coarsely granular	18	
Kinderhook group		
Chouteau formation		
Limestone, dense, medium-hard, earthy, speckled with occasional calcite crystals.....	6+	

Geologic Section No. 16.—*Strata at the foot of the east bluff of ravine NE. ¼ SE. ¼ sec. 13, T. 6 N., R. 12 W., Jersey County*

Mississippian system	
Iowa series	
Osage group	
Fern Glen formation	
Limestone, shaly, with some chert, grading below into shale, green to red, with some limestone and chert	25
Limestone, cream-gray, hard, massive, coarsely granular	8+

In the sides of the ravine north of these exposures limestone apparently of the Burlington formation lies immediately over the Chouteau formation. The usual dolomitic transitional zone between the Burlington and Chouteau formations is 25 feet thick but the characteristic Fern Glen red or green shales are absent. It has been suggested[4] that the Fern Glen formation grades laterally northward into the Sedalia formation, which in Illinois north of the Jersey-Greene area cannot be distinguished lithologically from the Burlington limestone. However, the complete disappearance of the characteristic Fern Glen strata within a distance of a few hundred feet at Chautauqua, as cited, suggests an unconformity between the Fern Glen and the base of the typical coarsely granular crinoidal Burlington limestone rather than a lateral gradation. On the other hand, fossils collected from the shaly Fern Glen limestone (Geologic Section No. 16) have been identified as early Osage.[5]

Typical Fern Glen strata are present to the east but the formation thickens chiefly to the south and southeast.

This formation is not important as a source of petroleum. The shaly members are either typically red and oxidized or calcareous rather than argillaceous and do not contain much hydrocarbon or bituminous matter. The limestone may be appreciably porous where it is thicker, and thin sand lenses are possibly present.

KEOKUK-BURLINGTON FORMATIONS

The Keokuk-Burlington formations which are herein grouped together because they can be hardly distinguished in the Jersey-Greene area, particularly in small outcrops, crop out at numerous places in a belt approximately five miles wide, depending on the dip of the rocks, and extending from the north part of Greene County to south-central Jersey County. They occur as high bluffs in the upper portions of ravines in southwest Jersey County and lower in the ravines in western Greene County and also crop out in small exposures in the valleys that dissect the uplands.

The Burlington formation, which constitutes the lower and greater part of the combined Burlington-Keokuk unit, is a white to cream-gray, coarsely granular, massive to thin-bedded limestone in which buff-colored dolomitic beds are interbedded, mostly at the bottom. Chert is irregularly distributed throughout the formation, especially near the top where it forms thin irregular beds. Although the formation is so largely composed of stem segments and other fragments of crinoids that it has been termed the "Crinoidal" limestone, it is

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[4] Moore, R. C., Early Mississippian formations in Missouri: Missouri Bureau of Geology and Mines, 2nd series, Vol. XXI, pp. 150-151, 1928.

[5] Ekblaw, George E., Concerning the stratigraphy of the Paleozoic rocks along the Mississippi River between Alton and Warsaw, Illinois: Master's thesis, University of Illinois, pp. 33-35, 1923 (unpublished).

otherwise sparingly fossiliferous, except at certain horizons. *Spirifer grimesi*, a typical Burlington fossil is plentiful at certain horizons in the lower part of the formation. Typical Burlington strata are exposed in sec. 25, T. 7 N., R. 13 W.; sec. 17, T. 8 N., R. 13 W.; secs. 9, 16, and 22, T. 9 N., R. 13 W.; and secs. 28 and 33, T. 10 N., R. 13 W.

The Keokuk limestone is a white to gray or bluish-gray, massive to thin-bedded, crinoidal limestone, with thin shale partings between some of the beds, and with chert irregularly distributed and interbedded. It is thinner bedded, more cherty, more shaly and more characteristically blue-gray than the Burlington, but in the Jersey-Greene area they are much more alike than farther north and northwest. Both the Keokuk and overlying Warsaw formations become more limy south from their type localities so that in the Jersey-Greene area the Keokuk resembles the Burlington and the Warsaw resembles the typical Keokuk. The Keokuk formation is fossiliferous, but the diagnostic *Spirifer keokuk* is rare. The formation is typically exposed in sec. 21, T. 6 N., R. 11 W.; sec. 2, T. 7 N., R. 12 W.; sec. 8, T. 8 N., R. 12 W.; sec. 2, T. 6 N., R. 12 W.; secs 26, 27, 33, and 34, T. 9 N., R. 12 W.; NE¼ sec. 8, T. 9 N., R. 12 W.; sec. 7, T. 9 N., R. 12 W.; sec. 1, T. 9 N., R. 13 W.; sec. 30, T. 12 N., R. 12 W.; SE. ¼ sec. 25, T. 11 N., R. 12 W.; NE. ¼ sec. 30, T. 10 N., R. 12 W.

The combined Keokuk-Burlington unit is 273 feet thick at Jerseyville (log No. 43), 215 feet thick at Roodhouse (log No. 11), and 230 and 250 feet thick at Carrollton (logs Nos. 30 and 31).

The Keokuk-Burlington formations at some places contain fresh water at shallow to moderate depths, in joint-crevices, solution cavities, and channels, from which it issues as springs.

WARSAW-SALEM FORMATIONS

In the Jersey-Greene area the shaly Warsaw formation, the uppermost member of the Osage group, grades upward into a more limy formation that is generally correlated with the Salem formation, the basal member of the Meramec group, and as their contact cannot be determined because of the gradation, they are herein described as a unit.

The Warsaw-Salem formations crop out in a belt which extends from the Mississippi River bluffs west of Alton, west of north to White Hall in Greene County, passing west of Jerseyville and through the town of Carrollton. The belt is about 5 miles wide at the south, but owing to the overlap of Pennsylvanian beds, it narrows toward the north, and northwest of White Hall only scattered outcrops occur.

The lower or Warsaw part of the unit is typically a blue, massive, earthy shale, calcareous at many places and hard at some. The calcareous phase of

the shale, which is locally a massive argillaceous limestone, is known as "cement rock" and was formerly quarried for the local manufacture of hydraulic cement. Old workings and kilns may be seen along the main road north of Piasa Creek in sec. 13, T. 6 N., R. 11 W. Interbedded with the "cement rock" are numerous lenses, locally several feet thick, of white to

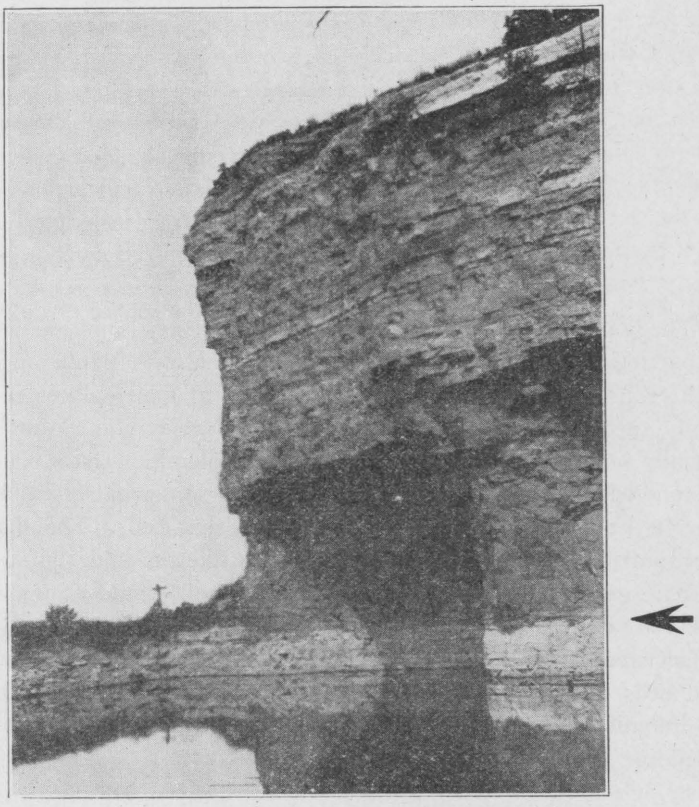

FIG. 2—Contact between the Salem and St. Louis formations as exposed in Hupp Hollow quarry, in the SE. ¼ sec. 4, T. 5 N., R. 10 W.

mottled or bluish, coarsely granular, fossiliferous limestone similar to the underlying Keokuk limestone and therefore difficult to identify in small outcrops.

In southern Jersey County, the lower 22 feet of the Warsaw formation is a bluish, coarsely granular, fossiliferous, locally crinoidal limestone with thin partings of blue shale and thin beds and irregular masses of chert, thus resembling the Keokuk formation and therefore also difficult to identify in small outcrops.

Geologic Section No. 17—*Combined section of outcrops in SW. ¼ sec. 4 and NW. ¼ sec. 9, T. 6 N., R. 11 W., Jersey County*

	Thickness Feet	Inches
Mississippian system		
Iowa series		
Meramec group		
Salem formation		
Limestone, granular, slabby		
Osage group		
Warsaw formation		
"Cement rock," hard, with soft shale and hard limestone lenses interbedded; a geode bed about 5 feet from the top	16	6
"Cement rock" and interbedded thin limestone	5	6
Shale	2	
Covered	22	
Limestone, blue gray, somewhat cherty, thin-bedded, platy, with thin shale partings	18	6

The upper or "Salem" part of the unit is mostly limestone with occasional thin partings, lenses, or beds of shale. The limestone is thin- to thick-bedded, fossiliferous, coarsely to finely granular, and at many places it is characteristically speckled light and dark. Some beds are oölitic. Many of the beds, especially near the top, are massive, earthy dolomite. In the south the thicker limestone beds are gray to white and granular, somewhat resembling the overlying St. Louis formation. Chert occurs in thin beds. The shale, of which the proportion increases downward, is much like the underlying typical Warsaw shale, generally blue in color but varies to yellow and brown which may be weathered phases of the blue. The Salem (?) limestone, especially in the north, is much weathered. The calcium carbonate is more or less leached, leaving pitted beds of hard clay and siliceous material stained red with iron oxide. The dolomite beds weather brown and friable and spall off in slabs across the bedding-planes and parallel to exposed surfaces.

Geologic Section No. 18—*Strata at the old cement works near the center of sec. 13, T. 6 N., R. 11 W., Jersey County*

	Thickness Feet	Inches
Mississippian system		
Iowa series		
Meramec group		
Salem formation		
Limestone, granular, medium-grained, mottled, thick-bedded	4+	
Osage group		
Warsaw formation		
Shale and limestone, shaly, thin-bedded	12	
Shale, hard, calcareous "cement rock," weathers buff	8	
Shale, somewhat calcareous, blue	5	

Geologic Section No. 19—*Strata near line between secs. 13 and 14, T. 6 N., R. 11 W., Jersey County*

	Thickness Feet	Inches
Mississippian system		
Iowa series		
Meramec group		
Salem formation		
Limestone, dark, drab, and mottled, granular, hard, slabby, medium to thin-bedded	10	
Osage group		
Warsaw formation		
Limestone, blue-gray to somewhat mottled, finely crystalline, hard, slabby, medium to thin-bedded	4	
Covered; probably shale or weathered dolomitic beds	3	
Limestone, blue-gray, slightly crystalline, mostly massive; contains large calcite geodes; otherwise similar to above	3	
Shale		1–4
"Cement rock," blue-gray, massive	3	
Shale, blue-gray, thin-bedded, compact	2	6
"Cement rock," blue-gray, massive	1	
"Cement rock," blue-gray, massive, and shale, thin-bedded	5	
Limestone, dolomitic, dense to finely granular, thick-bedded, weathers dark buff	2	
Shale, calcareous, blue-gray, thin-bedded	2	6
Covered	1	

Geologic Section No. 20—*Strata where the main road south of Delhi crosses Piasa Creek, Jersey County*

Pennsylvanian system		
Sandstone, white weathering rusty, with interbedded shaly layer	3	
Mississippian system		
Iowa series		
Meramec group		
St. Louis formation		
Shale, calcareous, gray-blue	1	
Covered	1	
Limestone, finely granular, gray	3	
Limestone, finely granular, gray, some conglomeratic	2	
Salem formation		
Limestone, dolomitic, weathering brown	1	
Covered	1	
Limestone, dark gray, cherty, finely granular, interbedded with dolomitic limestone	1	

Geologic Section No. 21—*Composite section from both sides of Piasa Creek, not far from Geologic Section 20*

Pennsylvanian system		
Sandstone, massive, thick-bedded, white to yellow, weathers buff	30	
Mississippian system		
Iowa series		
Meramec group		
St. Louis formation		
Conglomerate, containing chert pebbles	1	
Salem formation		
Limestone, dolomitic	6	
Limestone, gray, oölitic, granular, medium-grained	6	

Geologic Section No. 22—*Strata at the bridge near the center of sec. 20, T. 7 N., R. 11 W., Jersey County*

	Thickness Feet	Inches
Pennsylvanian system		
Sandstone, white to yellow, weathering dark and buff		
Mississippian system		
Iowa series		
Meramec group		
Salem formation		
Shale, calcareous, yellow; appears like weathered argillaceous limestone	2	
Shale, sandy to argillaceous, yellow	1	
Limestone, typically mottled, slabby, hard, granular, yellow-gray		

In the south part of Jersey County the Warsaw formation is not as thick as the Salem formation but in Greene County the two formations are of about equal thickness. At Jerseyville their combined thickness is 107 feet (log No. 43); at Carrollton, it is 113 feet (log No. 31).

MERAMEC GROUP

ST. LOUIS FORMATION

The St. Louis formation is exceedingly variable in character. It consists mainly of beds of sparingly fossiliferous limestone interbedded with dolomitic limestone and chert, but it contains also irregular bodies of chert, stringers and inclusions of calcite, and thin partings of green shale or clay. The texture of the limestone beds varies from granular and coarsely crystalline to dense and lithographic, the latter being characteristic of the St. Louis formation. The beds of granular and dolomitic limestone are massive whereas the dense limestone is thin-bedded. The rock is often brecciated.

The St. Louis formation crops out along the Mississippi River bluffs from Alton west for four miles, but to the north the area in which it crops out narrows rapidly because (1) the thickness of the formation decreases, (2) the formation dips steeply northeasterly, and (3) Pennsylvanian strata overlap the formation.

As a result of erosion which beveled the tilted beds (Pl. III), the St. Louis formation is represented by only 6 feet of dolomitic limestone in sec. 30, T. 7 N., R. 10 W., where it underlies a chert conglomerate at the base of the Pennsylvanian strata. Farther north the formation is represented only by a few feet of residual chert, clay, and weathered dolomitic limestone, cropping out in patches in secs. 22 and 23, T. 7 N., R. 11 W.; secs. 4, 5, and 31, T. 8 N., R. 11 W.; secs. 20, 32, and 33, T. 9 N., R. 11 W.; and sec. 30, T. 10 N., R. 11 W. Although it is much shattered, as the result of weathering and removal of interbedded limestones, the chert preserves indications of bedding at some places. The crumbling in some of the residual chert beds may have been occasioned by glacial pressure during the Pleistocene period.

The maximum thickness of the St. Louis formation cropping out in the Jersey-Greene area is found in the bluffs at Alton where a face of 183 feet was measured as follows:

	Feet
Interval from Ste. Genevieve formation (determined by the presence of *Platycrinus*), to a prominent dolomitic concretionary bed	66
Interval to top of prominent massive bed	25
Interval to shale and chert partings underlying thin dolomitic beds a few inches to 2 feet thick	16
Interval to a series of hard, resistant beds of crystalline limestone, interbedded with lithographic limestone, which forms the top of the old quarry face at Hopp Hollow	16
Interval to Salem formation, about 20 feet above railroad track	60
Total thickness	183

Less than a mile west it is only about 120 feet thick. It thins rapidly to the northeast, and north of Carrollton it has been entirely removed by erosion. Farther east, however, records of drill holes show the St. Louis formation is present in full thickness.

STE. GENEVIEVE FORMATION

The Ste. Genevieve formation resembles the St. Louis formation in that it consists of limestone varying from massive to thin-bedded and from coarsely crystalline to dense lithographic, but it differs in that the massive crystalline beds are much more dominant and in being remarkably pure and free from chert. Some beds near the top are arenaceous and in them cross-bedding is locally evident. The St. Louis and Ste. Genevieve formations can be readily distinguished not only by their lithologic differences but also by the fact that the fossil *Platycrinus penicillus* so far as known occurs only in the Ste. Genevieve.

The Ste. Genevieve formation crops out in the Jersey-Greene area only near Alton, Madison County, being exposed in Rock Springs Park, in the SE. corner sec. 1, T. 5 N., R. 10 W., and in the ravine south to Washington Gardens in the NE. ¼ sec. 13, T. 5 N., R. 10 W., in the ravines and quarries in sec. 11, T. 5 N., R. 10 W., in the upper ravines and quarries in Hupp Hollow, sec. 3, T. 5 N., R. 10 W., and in Wood River at the bridge in the SE. ¼ sec. 17, T. 5 N., R. 9 W. The quarries near the intersection of the Chicago and Alton Railroad with Alby Street halfway up the hill, are believed to be in basal Ste. Genevieve.

Geologic Section No. 23—*Bluff West of Alton, Madison County*

	Thickness	
Mississippian system		
Iowa series	*Feet*	*Inches*
Meramec group		
Ste. Genevieve formation (or Chester series)		
Limestone	2	

Sandstone	15
Ste. Genevieve formation	
Limestone, thinly and irregularly bedded	15
Shale and sandy beds, partly covered	8
Limestone, massive, stratification poor; weathers smooth	15
Limestone, light gray, massive, interbedded with yellowish limestone in lower portion	25
Limestone, arenaceous, cross-bedded	10
Limestone, massive	10
St. Louis formation	

The 15-foot sandstone underlying a 2-foot limestone at the top of the bluff may be the base of the Chester series, but the sandstone has not been found in drill records to the east. As there is no other evidence that the Chester extends so far west, it seems more probable that the strata are part of the Ste. Genevieve, corresponding to the Rosiclare sandstone of southern Illinois.

The above geologic section is believed to represent the total and the the maximum thickness of the Ste. Genevieve formation in the Jersey-Greene area, as corroborated by the relation of the quarries near Alby Street to the Ste. Genevieve-Pennsylvanian contact in Rock Springs Park.

North and west of Alton the Ste. Genevieve formation was eroded and overlapped by Pennsylvanian formations. It occurs again along the east line of Jersey and Greene counties, and about 6 miles beyond the Macoupin County line it occurs in full thickness for the region, being overlain by the regular Chester series.

Both the St. Louis and Ste. Genevieve formations thicken to the east, southeast, and south. As a general rule the lower Mississippian beds dip a little more steeply than do the upper ones, which in turn dip more steeply than do the overlying Chester and Pennsylvanian strata.

Pennsylvanian System

Pennsylvanian strata, comprising beds of conglomerate, sandstone, shale, underclay, coal, and limestone, and dipping slightly eastward, overlap the truncated, more steeply dipping Mississippian beds, so that they lie on successively older formations, from the Ste. Genevieve in the south to the Keokuk-Burlington in the north (Pls. I and III and Table 1, p. 12).

Pleistocene System

The Pleistocene system includes unconsolidated glacial drift, loess, soil, and alluvial deposits which cover the bedrock except where removed by streams.

The glacial drift, which mantles the area and fills some pre-glacial valleys, varies in thickness from 20 to nearly 200 feet. It consists mainly of blue till, or clay in which are embedded sand, pebbles, cobbles, and occasionally

large boulders. Below, and sometimes interbedded with the clay, are lenses and strata of sand and gravel which form the water reservoirs that are tapped by shallow wells. At some places a buff to yellow gravelly clay is present above the blue clay.

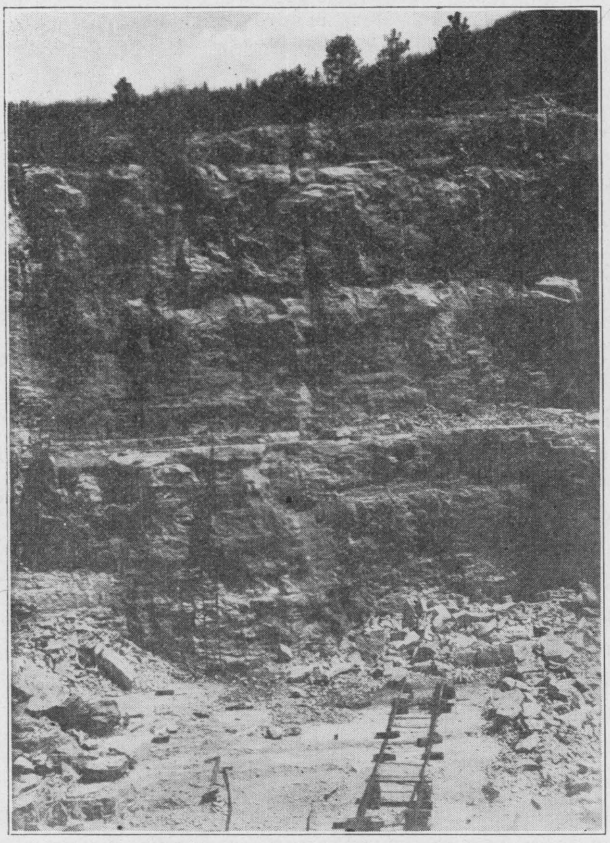

FIG. 3—Ste. Genevieve and St. Louis formations as exposed in quarry at Alton.

Loess, which consists of dust, silt, and sand blown from the river flats, overlies the drift and caps the bluffs along the valleys of Illinois and Mississippi rivers. It attains a maximum thickness of 60 feet and is calcareous below the zone leached by surface waters. The soil of the upland slopes adjacent to the bluffs is more yellow and sandy than elsewhere because of the admixture of weathered loess.

The principal alluvial deposits are the Illinois and Mississippi river bottoms; alluvial terraces occur in the upland valleys of some of the larger streams.

CHAPTER III—GEOLOGIC HISTORY

In attempting to evaluate the oil possibilities of any particular area it is desirable to reconstruct so far as possible the succession of events which resulted in the rock strata and structures as now observed. These may be determined from the character, attitude, and relations of the rock strata which reflect the conditions under which they were deposited and the changes which they have subsequently undergone. In the Jersey-Greene area the strata from Ordovician to Mississippian consist of marine sediments, their character being determined by several factors, among which probably the most important is the extent of the sea in which they were deposited. This was controlled by the broad earth movements which alternately elevated and depressed the area with reference to sea-level and also by local tilting and warping, especially of the Ozarkian land mass on the southwest.

At the beginning of an epoch of submergence, the sea gradually encroached upon the land area and at the end it gradually but probably more rapidly receded. Consequently the sediments deposited during any one epoch of submergence were generally thicker in the direction from which the sea advanced and towards which it retreated, and the later or younger deposits of the epoch are generally more extensive. Not infrequently the earth movements which elevated the area and caused a retreat of the sea tilted or folded the strata. Subsequent erosion naturally affected the higher land areas most, and consequently, all other things being equal, any formation is thicker in the direction of down-tilting or down-folding. During the following submergence the earlier formations were covered by later deposits. Thus the character, relations, attitude, and regional thicknesses of the various formations provide indices by which the extent of the seas during respective submergences, the direction of the oscillations of the sea, and the direction of tilting may be ascertained.

In the Jersey-Greene area the regional dip of the strata is towards the east. The Mississippian and lower strata have an average dip of approximately 37½ feet per mile, whereas the Pennsylvanian strata have an average dip of only approximately 12½ feet per mile. This situation is evidence that at the close of the Mississippian period there was a marked down-tilting towards the east, which was intensified at the close of the Pennsylvanian period. Local warping in connection with the major tilting creates some departures from the regional dip. The formations older than Mississippian were also

doubtless subjected to tilting and folding in connection with the earth movements that caused the respective pre-Mississippian submergences and emergences of the area, but these movements were so slight that they do not affect appreciably the general parallellism between the Mississippian and older strata. As a consequence of the eastward regional dip, the strata in the Jersey-Greene area crop out in narrow bands which trend generally north-northwest-southsoutheast, and which are successively younger from west to east (Pl. III).

The geologic history of the Jersey-Greene area may be conveniently tabulated, as in Table 3.

CHAPTER IV—STRUCTURE

The structure of the Jersey-Greene area west of the Mississippian-Pennsylvanian contact is depicted (Pl. I) by contours showing the elevation of the base of the Osage group which has been chosen as a key horizon. The necessary data were secured by determining the elevation of surface outcrops and the curb elevations of wells and borings and then adding to or subtracting from each elevation an amount equal to the vertical interval to the chosen key-horizon as determined from the nearest measured geologic section or well log. Where the key-horizon has been removed by erosion its theoretical position has been projected or reconstructed from the local dips and the known stratigraphic interval. The positions of outcrops or well borings used as datum points are shown (Pl. I). In areas where datum points are few the structure is not so satisfactorily established as where they are numerous. In using the map, therefore, the number and distribution of datum points controlling the contour lines should be carefully noted as they are an index to the relative accuracy of the structure as depicted. The regional structure and variations are discussed above. Some of the structural features are worthy of special note.

Lincoln Fold

The principal structural feature in the area is an asymmetrical anticline in the southwest corner of Jersey County. It trends north of west from Grafton and plunges southeastward. The south limb dips as much as 45° but the north limb is gently undulatory for about two miles and then dips about 55 feet to the mile as far as Rosedale. Inasmuch as the Kimmswick limestone is exposed in the center of the fold near the center of sec. 11, T. 6 N., R. 13 W., whereas the normal regional dip would bring into outcrop a formation only as low as the Niagaran, the fold involves a vertical upthrust of about 200 feet.

Several minor anticlines are associated with the Lincoln fold where it plunges eastward. A fault zone trending northeast-southwest cuts across the Lincoln fold near the Illinois Power Company's plant about one and a quarter miles east of Grafton (Pl. II). The downthrow side of the fault is to the east and at the river bluff amounts to 75 or 80 feet, but it decreases until the fault dies out, probably a mile or two to the northeast.

Pittsfield-Hadley Anticline

Another prominent anticline in northwest Greene County is the southeastward continuation of the Pittsfield-Hadley anticline of Pike County, Illinois.[1] The axis of the fold passes between Hillview and Drake. A low isolated dome occurs at the southeastern end of the structure, beyond which the fold plunges southeastward towards Berdan.

The youngest rocks exposed on the anticline in Greene County are early Mississippian in age, although remnants of Pennsylvanian sandstone, conglomerate, and clay without sufficient bedding or elevation to indicate other than regional dip are found along its flanks. In Pike County strata of both early Mississippian and Pennsylvanian age are involved in the structure, the Pennsylvanian strata being exposed only on the flanks and having less dip than the older beds. This indicates that some of the folding occurred in pre-Pennsylvanian times but most of it occurred since the Pennsylvanian period.

Beltrees-Melville Anticline

Slight flexure extending north of east from Chatauqua and Elsah in south Jersey County becomes a distinct eastward plunging anticline about a mile north of Beltrees, whence it continues plunging more steeply in a trend slightly north of east for three miles and then swings more to the south where it flattens and broadens northeast of Melville. It probably continues across Mississippi River in a direction slightly east of south, and is associated with a slight anticlinal nose apparent in the neighborhood of East Alton. The broadest part of the structure, north and northeast of Melville, forms a structural terrace covering several square miles.

Nutwood-Fieldon Anticline

Two plunging anticlines diverge from the vicinity of Nutwood in west Jersey County. The axis of one trends north of east to Fieldon, and the other trends east of north to sec. 12, T. 8 N., R. 13 W.

Kane Anticline

An anticlinal nose originates four or five miles west of the village of Kane along the Jersey-Greene county-line and trends and plunges eastward and then northward to sec. 13, T. 9 N., R. 12 W., where it dies out in a steeper regional northeast dip.

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[1] For a description of the Pittsfield-Hadley anticline, Pike County, see: Krey, Frank, Structural reconnaissance of the Mississippi Valley area from Old Monroe, Missouri, to Nauvoo, Illinois: Illinois State Geol. Survey, Bull. No. 45, p. 49, 1924.

Carrollton Anticlines

Two small plunging anticlines occur in the vicinity of Carrollton, one at the town and another farther south towards Macoupin Creek. The south fold is narrow and trends and plunges northeast. The structure at Carrollton, which has its best development immediately west of the town, trends and plunges to the east.

Drake-White Hall Anticline

A subordinate plunging anticline, paralleling the adjacent Pittsfield-Hadley anticline, extends from the northeast corner of T. 12 N., R. 13 W., southeast to White Hall.

Table 4.—*Selected datum points to accompany Structure Map of Parts of Jersey, Greene, and Madison Counties, Illinois*

Key horizon, base of Osage group
Datum, sea-level

Map No.	Location Sec.	T-N.	R-W	Formation outcropping or Name of well	Surface elevation	Interval to key horizon	Elevation of key horizon
	Greene County.				(Feet)	(Feet)	(Feet)
1	31	12	12	Seely well	603	—245	358
2	34	12	12	Eugene Knight farm well	589	—240	349
3	35	12	12	White Hall Ice-plant well	575	—355	220
4	14	12	13	A. L. McClay farm well No. 2.	443	2	445
5	23	12	13	A. L. McClay farm well No. 1.	657	—105	552
6	1	11	13	George Berline farm well	615±	—220	395±
7	9	11	13	Hartwell Ranch well	444	56±	500±
8	3	11	12	Warsaw formation	564	—260	304
9	14	11	12	H. Baines farm well	518	—30	488
10	17	11	12	Pitts farm well	569	—45	524
11	21	11	12	S. Edwards farm well	544	—227	317
12	36	11	12	Warsaw formation	468	—220±	248±
13	9	10	12	Warsaw formation	537	—237±	300±
14	22	10	12	Hough farm well	610	—250+	360—
15	22	10	12	Carrollton City well	606	—300	306
16	26	10	12	Carrollton Community well	595	—435	160
17	30	10	12	Vedder farm well	570	—253	317
18	31	10	12	Jehosaphat Eldred farm well	570	—267	303
19	35	10	12	Salem formation	491	—355	136
20	35	10	13	C. L. Watson farm well	615±	—265	350±
21	16	9	13	Burlington formation	492	—15	477
22	22	9	13	Burlington formation	450	—25±	425
23	1	9	12	Salem formation	458	—325	133
24	2	9	12	Salem formation	490	—355	135
25	15	9	12	Warsaw-Keokuk contact	535	—235±	300±
26	10	9	12	Warsaw-Keokuk contact	494	—235±	259±
27	18	9	12	Warsaw-Keokuk contact	583	—260	323
28	21	9	12	Keokuk formation	438	—190±	248±
29	24	9	12	Warsaw formation	494	—260±	234±
30	26	9	12	Warsaw-Keokuk contact	509	—255±	254±
31	34	9	12	Keokuk-Burlington contact?	527	—245—	282+
32	6	9	11	Salem formation	450	—335	115
33	7	9	11	Salem-Warsaw contact	455	—310	145

Map No.	Location Sec.	T-N.	R-W	Formation outcropping or Name of well	Surface elevation	Interval to key horizon	Elevation of key horizon
					(Feet)	(Feet)	(Feet)
34	8	9	11	Salem formation	445	—365±	80±
35	16	9	11	Salem formation	442	—355±	87±
36	17	9	11	Salem formation	475	—335±	140±
37	19	9	11	Salem formation	476	—310	166
38	20	9	11	Salem formation	501	—365	136
39	32	9	11	Kane schoolhouse well	553	—335	218
	Jersey County						
40	4	8	11	St. Louis formation	510	—380	130
41	8	8	11	Salem formation	522	—368	154
42	21	8	11	Jerseyville city well No. 2	646	—480	166
43	31	8	11	Salem-Warsaw contact	529	—342	187
44	3	8	12	Warsaw-Keokuk contact	524	—238	286
45	8	8	12	Keokuk-Burlington contact	497	—188—	309+
46	21	8	12	Warsaw formation	584	—300±	284±
47	34	8	12	Warsaw-Keokuk contact	587	—238	349
48	35	8	12	Warsaw-Keokuk contact	545	—238	307
49	34	9	13	Burlington formation	477	—7±	470±
50	3	8	13	Base of Osage group	471	0	471
51	4	8	13	Base of Osage group	507	0	507
52	12	8	13	Base of Osage group	469	0	469
53	16	8	13	Base of Osage group	512	0	512
54	17	8	13	Base of Osage group	531	0	531
55	21	8	13	Base of Osage group	540	0	540
56	21	8	13	Base of Osage group	560	0	560
57	28	8	13	Kinderhook-Devonian contact	466	135	601
58	33	8	13	Base of Osage group	600	0	600
59	34	8	13	Base of Osage group	570	0	570
60	35	8	13	Base of Osage group	551	0	551
61	1	7	13	Burlington formation	471	—25	446
62	2	7	13	Base of Osage group	500	0	500
63	2	7	13	Base of Osage group	510	0	510
64	2	7	13	Base of Osage group	488	0	488
65	3	7	13	Base of Osage group	600	0	600
66	3	7	13	Base of Osage group	560	0	560
67	4	7	13	Base of Osage group	620	0	620
68	4	7	13	Base of Osage group	560	0	560
69	9	7	13	Base of Osage group	580	0	580
70	10	7	13	Base of Osage group	575	0	575
71	11	7	13	Base of Osage group	565	0	565
72	11	7	13	Base of Osage group	520	0	520
73	12	7	13	Base of Osage group	456	0	456
74	14	7	13	Base of Osage group	580	0	580
75	15	7	13	Base of Osage group	575	0	575
76	15	7	13	Base of Osage group	600	0	600
77	16	7	13	Base of Osage group	600	0	600
78	22	7	13	Base of Osage group	600	0	600
79	23	7	13	Base of Osage group	610	0	610
80	23	7	13	Base of Osage group	610	0	610
81	26	7	13	Base of Osage group	620	0	620
82	27	7	13	Base of Osage group	640	0	640
83	27	7	13	Base of Osage group	680	0	680
84	28	7	13	Base of Osage group	650	0	650
85	33	7	13	Base of Osage group	730	0	730
86	34	7	13	Base of Osage group	730	0	730
87	35	7	13	Base of Osage group	760	0	760
88	2	6	13	Base of Osage group	790	0	790
89	9	6	13	Base of Osage group	770	0	770
90	10	6	13	Base of Osage group	740	0	740

Map No.	Location Sec.	T-N.	R-W	Formation outcropping or Name of well	Surface elevation	Interval to key horizon	Elevation of key horizon
					(Feet)	(Feet)	(Feet)
91	10	6	13	Base of Osage group	760	0	760
92	11	6	13	Top of Kimmswick	580	340	920
93	11	6	13	Base of Osage group	820	0	820
94	2	7	12	Warsaw formation	570	—294	276
95	11	7	12	Warsaw-Keokuk contact	541	—260	281
96	12	7	12	Warsaw-Keokuk contact	499	—260	239
97	23	7	12	J. Tidball farm well	522	—175	347
98	33	7	12	J. T. Elmore Co. oil test well, Bell No. 1	770	—275	495
99	4	6	12	Base of Osage group	684	0	684
100	9	6	12	Base of Osage group	682	0	682
101	10	6	12	Base of Osage group	639	0	639
102	11	6	12	Kinderhook-Devonian contact	514	97	611
103	13	6	12	Illinois Powder Mfg. Co. well (at glycerine factory)	598	—107	491
104	8	7	11	Salem-Warsaw contact	549	—342	207
105	18	7	11	Warsaw formation	549	—300—	249+
106	20	7	11	Salem-Warsaw contact	587	—342	245
107	22	7	11	Salem formation	554	—374	180
108	25	7	11	Salem-Warsaw contact	461	—342	119
109	28	7	11	Richard Gilham farm well	740	—550	190
110	32	7	11	Winters Bros., Morrow & Dice oil-test well, Mary McDow No. 1	665±	—412	253±
111	32	7	11	Salem-Warsaw contact	560	—342	218
112	3	6	11	Salem-Warsaw contact	510	—342	168
113	4	6	11	Warsaw formation	565	—332±	233±
114	5	6	11	Warsaw-Keokuk contact	568	—285	283
115	6	6	11	George Duncan farm well	665±	—305—	360±
116	8	6	11	Warsaw-Keokuk contact	552	—289	263
117	9	6	11	Warsaw-Keokuk contact	513	—285	228
118	9	6	11	Warsaw-Keokuk contact	518	—289	229
119	11	6	11	Salem-Warsaw contact	574	—342	232
120	12	6	11	St. Louis-Salem contact	533	—396	137
121	13	6	11	Salem-Warsaw contact	451	—326	125
122	14	6	11	Salem-Warsaw contact	488	—326	162
123	14	6	11	Warsaw formation	450	—259+	191—
124	15	6	11	Salem-Warsaw contact	495	—259	236
125	18	6	11	Osage-Chouteau contact	424	0	424
126	21	6	11	Salem-Warsaw contact	676	—332	344
127	22	6	11	Salem-Warsaw contact	524	—279	245+
128	22	6	11	Salem-Warsaw contact	534	—279	255
129				Salem formation	507	—376±	131±
130	6	6	10	Salem formation	463	—384— —333+	79+ 130—
131	19	6	10	St. Louis-Salem contact	508	—405	103
132	28	6	10	St. Louis formation	515	—405+	110—
	(near 130)			Salem-Warsaw contact	430	—328	102
133				St. Louis-Salem contact	508	—405	103
134	31	6	10	St. Louis-Salem contact	477	—395	82
135	32	6	10	St. Louis-Salem contact	450	—390	60
136	3	5	10	Ste. Genevieve-St. Louis contact	532	—536	—4

CHAPTER V—OIL POSSIBILITIES

Conditions essential for the accumulation of oil into "pools" are (1) a *source rock* which originally contained large amounts of organic matter from which it is now generally believed petroleum is derived, (2) a *reservoir rock* or porous stratum in which the oil may collect in appreciable amounts, (3) an impervious *"cap rock"* which will retain the oil in the reservoir, and (4) *structural features,* such as tilting, anticlinal folding, terracing, or faulting, which will tend to concentrate appreciable amounts of oil within comparatively small areas.

Lincoln Fold

There is little possibility of finding oil in the Lincoln fold, in southwest Jersey County. In the first place the strata from the Mississippian to the Kimmswick (Ordovician) rise for the most part without minor flexures or interruptions to their outcrops in the fold, so that if they had ever contained any oil, it would have risen along the dip and escaped at the outcrops. In the second place the strata beneath the Kimmswick formation that remained closed almost certainly do not contain petroleoum. In the third place, the factors that make the fault zone east of Grafton (Pl. II) a possible locus for the accumulation of oil—namely, (1) it offers the only exception to the continuous gradual rise of the strata, (2) its position favors the accumulation of oil in porous strata, and (3) it has a displacement less than the thickness of the Maquoketa formation, so that along the fault shale abuts shale for a maximum vertical distance of approximately 50 feet, thereby providing one condition satisfactory for a seal by which any possible oil in the "Trenton" rock beneath the shale might be prevented from escape by migration up the fault plane—are offset by the facts that (1) there is evidence that the fault zone is shattered and therefore not likely to act as a seal in preventing passage of oil through the Kimmswick formation from downthrow to upthrow side of the fault nor in preventing escape up the fault plane and (2) a well located a quarter of a mile west of the common north corner of secs. 13 and 14, T. 6 N., R. 12 W., almost in the fault zone but probably on the downthrow side, passed completely through the "Trenton" formation to the St. Peter sandstone without finding oil in commercial quantities.

Pittsfield-Hadley Anticline

The Pittsfield-Hadley anticline was an important source of gas in Pike County for many years, the production being controlled by structural crests or domes along the anticlinal axis. In northwest Greene County, the crest of the fold is flat and elongate, rising at its southeastern extremity to an isolated dome which has a closure of about 25 feet.

A well (log No. 22) drilled almost on the crest of the closed dome near the center of sec. 17, T. 11 N., R. 12 W., is reported to have penetrated 155 feet of the Devonian-Silurian or "Niagaran" limestone, which in Pike County is the horizon of gas production, and also 95 feet of underlying Maquoketa shale. A well (log No. 6) in the SW. ¼ sec. 26, T. 13 N. R. 13 W., low down on the structure, penetrated 136 feet of Devonian-Silurian strata. A well in the SW. corner sec. 14, T. 12 N., R. 13 W. (log No. 7), half-way down the flank of the fold, passed through only 45 feet of "Niagaran" and through 384 feet of the "Trenton" with a show of oil logged from 5 to 20 feet below its top. A well in the SW. ¼ sec. 23, T. 12 N., R. 13 W. (log No. 8), almost on the crest of the anticline, penetrated 182 feet of shale which is probably Hannibal-Sweetland Creek.

In view of these data, it appears that tests of the "Niagaran" and "Trenton" would be justified along the crest of the structure, particularly if local closures can be established. The existence and magnitude of closure can be tested by drilling to the base of the Burlington which occurs at depths ranging from 45 feet (log No. 22) to 150 feet. Four or five test wells to an average depth of 100 feet would cost little and would determine desirable locations for wells to test the Kimmswick formation.[2] The depth to the top of the "Trenton" on the crest of the anticline is from 425 to 475 feet. In considering the chances for oil production in this structure it must be borne in mind that a test of the "Trenton" in the gas structure in Pike County failed to obtain oil, and that other tests to the "Trenton" in western Illinois have been equally disappointing.

Beltrees-Melville Anticline

There is no evidence of closure on the Beltrees-Melville plunging anticline, although local structural closure may occur in the broad, terrace-like part of the structure northeast and north of Melville.

Nutwood-Fieldon Anticlines

Although no closures are known on the Nutwood-Fieldon structures they may occur between Nutwood and Fieldon. However, the only possible

[2] If test wells are drilled, the Illinois State Geological Survey will gladly cooperate by suggesting most critical locations, by studying and interpreting the logs and samples of well cuttings, and by advising later the most favorable location for a test to the Kimmswick limestone.

oil horizon is the "Trenton" and as it occurs at a depth of 350 feet and crops out across the river to the west, reversal of folding sufficient to have prevented the migration of oil to the outcrop does not seem probable.

Kane Anticline

The data are not sufficient to determine whether the Kane structure has any closure although a closure of not more than 25 feet may occur in Mississippian strata. However, neither the area nor the amount of possible closure appear large enough to warrant testing for oil unless production is obtained in neighboring structures.

Carrollton Anticline

No closures are known to occur on the Carrollton structures. A small dome with a possible closure of not more than 20 feet may occur on the anticlinal fold immediately west of Carrollton, but without definite proof of closure these structures are not recommended for testing. If closures are established, the structures may then deserve testing.

Drake-White Hall Anticline

No closure on the Drake-White Hall plunging anticline can be definitely proved by surface data. If production be found on the Pittsfield-Hadley anticline, this lower structure on its flank might be worth testing. Wells on the north line of sec. 2, T. 11 N., R. 12 W., and near the center of sec. 34, T. 12 N., R. 12 W., are located on the more steeply plunging portion of the structure. The "Trenton" probably lies 100 to 150 feet lower structurally at these points than farther northwest along the axis of the fold.

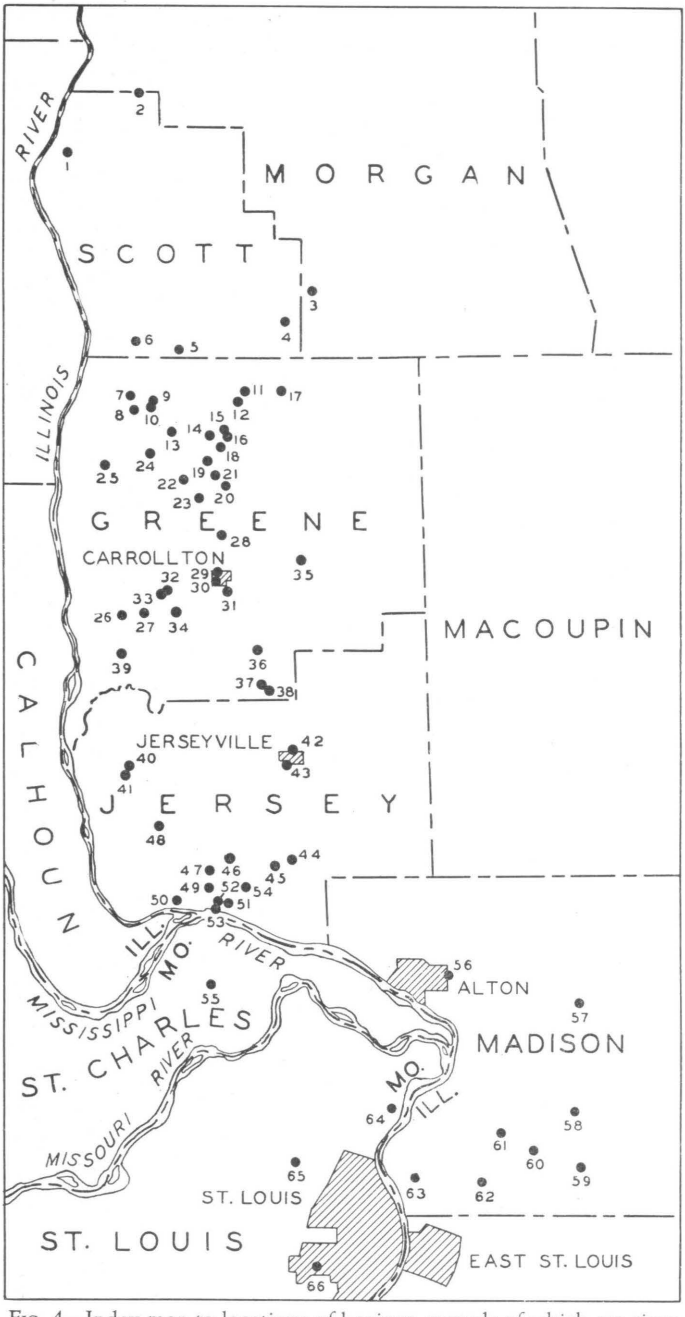

FIG. 4—Index map to locations of borings, records of which are given in the appendix.

APPENDIX

WELL LOGS

Compiled and Correlated by George E. Ekblaw and L. E. Workman

1. Scott County Oil and Gas Company test well,[1] Walter Tash No. 1, NE. corner SE. ¼ NE. ¼ Sec. 24, T. 15 N., R. 14 W., Scott County, Illinois
Elevation 437 feet[2]

	Thickness Feet	Depth Feet
Pleistocene system		
Sand and gravel	104	104
Mississippian system		
Iowa series		
Osage group		
Burlington formation		
Limestone, very cherty, dolomitic at some horizons, light buff, fine- to coarse-grained; chert light gray in color	57	161
Limestone, dolomitic, cherty, white, very finely crystalline	18	179
Limestone, cherty, white with faint green tint, coarsely granular; shale, dolomitic, green, weak	5	184
No samples	10	194
Limestone, cherty, white, medium to coarsely granular	25	219
Limestone, dolomitic, light buff with green tint, finely crystalline with coarse grains imbedded, glauconitic	7	226
Kinderhook group		
Hannibal formation		
Shale, silty, calcareous, greenish-blue, slightly micaceous, weak; at some horizons some siltstone, calcareous, gray, tough	81	307
Sweetland Creek formation		
Shale, silty, slightly calcareous, brown micaceous, tough, contains *Sporangites*	109	416
Silurian system		
Niagaran series		
Limestone, very dolomitic, white, finely crystalline	12	428
Dolomite, white, finely crystalline	22	450
Limestone, dolomitic, white with greenish tint, very coarsely granular; shale, green, weak	16	466
Limestone, dolomitic, white, crystalline, very finely granular	6	472
Limestone, cherty, white, crystalline, very finely granular	11	483
Limestone, dolomitic, light buff, crystalline, very finely granular	14.5	497.5

[1] Log derived from samples of well cuttings studied by L. E. Workman.
[2] Elevation estimated from Griggsville quadrangle topographic map.

	Thickness Feet	Depth Feet
Ordovician system		
Cincinnatian series		
Maquoketa group		
Shale, slightly calcareous, bluish-gray, firm	60.5	558
Shale, brown, tough, micaceous	12	570
Limestone, dolomitic, cherty, white, semi-crystalline, coarsely granular, spotted with dark brownish-gray fragments of fossils; shale, dolomitic, greenish-gray	8	578
Dolomite, gray, finely crystalline, spotted with dark brownish-gray fossil fragments; shale, dolomitic, greenish-gray, more abundant at base	15	593
Shale, dolomitic, gray, weak; contains dolomite, argillaceous, gray, fine-grained at 612-623 feet	86	679
No samples	4.5	683.5
Mohawkian series		
Kimmswick formation		
Limestone, dolomitic, buff, finely granular	57.5	741

2. Texas Company oil-test, Mueller No. 1, center NE. ¼ Sec. 2, T. 15 N., R. 13 W., Scott County, Illinois[3]

Elevation 561 feet[4]

No record	265	265
Mississippian system		
Iowa series		
Osage group		
Keokuk (?) and Burlington formations		
Limestone, cherty, white, very coarsely granular, and dolomite, cherty, light buff to light gray, very finely crystalline; white chert	165	430
Kinderhook group		
Hannibal formation		
Shale, silty, slightly calcareous, blue	55	485
Sweetland Creek formation		
Shale, silty, bluish-gray and brownish-gray to brown, weak to firm, micaceous	80	565
Shale, dark brown, tough, pyritic, micaceous	50	615
Shale, silty to very finely sandy, slightly calcareous, bluish and brownish-gray, weak	20	635
Silurian system		
Niagaran series		
Limestone, very dolomitic, slightly cherty, slightly sandy, white, finely crystalline	20	655
Dolomite, light gray and light greenish-gray, finely crystalline	30	685
Limestone, more or less dolomitic, very coarsely granular, with finely crystalline dolomite	10	695
Limestone, slightly glauconitic, white with light green tint, sublithographic, pencilled with shale, glauconitic, green, weak	10	705
Limestone, very dolomitic, cherty, slightly glauconitic, light buff, very coarsely granular with fine dolomite crystals; chert is white, dense	15	720

[3] Log derived from samples of well cuttings studied by L. E. Workman.
[4] Elevation determined by E. T. Benson.

	Thickness Feet	Depth Feet
Ordovician system		
Cincinnatian series		
Maquoketa group		
Shale, silty, light blue, weak	55	775
Shale, calcareous, bluish-gray, weak; shale, sandy, slightly calcareous, dark brown, tough; limestone, brown, medium-grained, contains brown phosphatic casts of fossils	10	785
Shale, brown, tough, micaceous, fossiliferous	15	800
Shale, silty, dolomitic, gray, firm; limestone, argillaceous, gray, very fine-grained; shale, brown, tough; limestone, brown, medium-grained, contains brown phosphatic casts of fossils	30	830
Shale, silty, calcareous and dolomitic, gray; limestone, argillaceous, gray, very fine-grained	60	890
Shale, very dolomitic, brown, firm	10	900
Mohawkian series		
Kimmswick formation		
Limestone, dolomitic, light buff with dark brown spots, grading from finely granular in upper part to coarsely granular near base	145	1045
Decorah formation		
Limestone, light brown to brownish-gray, lithographic to coarse-grained, grading to dolomite, argillaceous, light brown, finely to medium crystalline and to shale, calcareous and dolomitic, dark brown to gray, firm	35	1080
Plattin formation		
Limestone, dolomitic, cherty, light brownish-gray, very finely crystalline, interlaminated with limestone, slightly dolomitic, light buff, extra finely crystalline, chalky	35	1115
Limestone, grayish-brown, sublithographic	15	1130
Limestone, dolomitic, mottled brownish-gray and gray, lithographic to very finely crystalline, sandy at base	35	1165
Chazyan series		
Joachim formation		
Limestone, partly sandy, light brownish-gray to brown, semilithographic to coarse-grained, locally oölitic, grading through argillaceous limestone to shale, calcareous, partly sandy, greenish-gray to brown; sandstone in upper 10 feet	25	1190
Dolomite, light brown with brown argillaceous spots, very finely crystalline	17	1207
Dolomite, sandy, light brownish-gray, very finely crystalline, and shale, dolomitic, greenish-gray and brown, firm	20	1227
St. Peter formation		
Sandstone, white, medium- to coarse-grained, well assorted, well rounded	18	1245

3. P. C. Irwin et al test well,[5] Clark No. 1, SW. corner SE. ¼ NE. ¼ Sec. 11, T. 13 N., R. 11 W., Morgan County, Illinois
Elevation 685 feet[6]

	Thickness Feet	Depth Feet
Pleistocene system		
Silt, clayey, non-calcareous, buff (loess and till?)	15	15
Sand and gravel; driller reported black "slate" (clay) with gas at 69-71 feet	85	100
Till, sandy, calcareous, brown	8	108
Till, very sandy, calcareous, brown, and peat	17	125
Pennsylvanian system		
Shale, dolomitic, greenish-gray, weak	15	140
Shale, slightly dolomitic, bluish-gray, and brownish-gray, soft	39	179
Shale, calcareous, carbonaceous, black, dark brown and gray, fossiliferous, weak	20	199
Coal, pyritic, and shale, gray	3	202
Shale, yellowish-green to greenish-gray, firm	8	210
Limestone, argillaceous, gray mottled dark and brown, fine-grained, pyritic, fossiliferous	9	219
Shale, dolomitic (?), partly carbonaceous, yellowish-gray to black, micaceous, laminated, weak	16	235
Mississippian system		
Iowa series		
Meramec group		
St. Louis formation		
Dolomite, sandy, cherty, light yellowish-gray, finely granular; chert is oölitic, gray	15	250
Limestone, light yellowish-gray to light brownish-gray with greenish spots, lithographic to very fine-grained	25	275
Limestone, dolomitic, partly sandy and argillaceous, light brownish-gray to light greenish gray, very finely granular; sandstone, dolomitic, light green, very fine-grained at base	10	285
Limestone, light grayish-brown to light brownish-gray, lithographic to medium granular, oölitic, cherty, silty at base	20	305
Siltstone, sandy, dolomitic, cherty, green to brown, very finely granular, glauconitic, micaceous, compact; pinkish at top; grades to fine-grained sandstone at base	15	320
Salem formation		
Dolomite, sandy, brownish-gray with dark spots, very finely crystalline; shale, sandy, light brownish-gray	20	340
Dolomite, brown to light gray, finely granular, vesicular; shale, partly sandy, brown, micaceous	20	360
Dolomite as above and limestone, sandy, buff, coarsely granular, glauconitic	10	370
Osage group		
Warsaw formation		
Siltstone, sandy, dolomitic, micaceous, dark gray, grading to shale, sandy, dolomitic, micaceous, dark gray, firm; chert, white	5	375

[5] Log to 400 feet derived from samples of well cuttings studied by D. M. Delo and L. E. Workman; driller's log below 400 feet.

[6] Estimated from Winchester quadrangle topographic map.

	Thickness Feet	Depth Feet
Dolomite, shale, and chert as above	5	380
Limestone, argillaceous, dolomitic, light gray, brownish-gray and greenish-gray, coarsely granular, compact; dolomite, shale, and chert as above	10	390
Shale, very dolomitic, gray, fine-grained, micaceous, laminated; dolomite, limestone, and chert as above	10	400
Shale, dark gray	28	428
Keokuk formation		
Limestone, white to light bluish-gray	47	475
Limestone, gray and brown	12	487

4. Manchester Mining Company test boring,[7] Sec. 21 or 22, T. 13 N., R. 11 W., Scott County, Illinois

Elevation 690± feet[8]

Pleistocene system		
Soil, clay, and gravel	59	59
Pennsylvanian system		
"Fireclay" (shale)	7	66
Coal, slaty	1	67
Shale, clayey (underclay?)	10	77
Sandstone	1	78
Coal (No. 6)	2	80
Sandstone, hard	7	87
Shale, clayey	10	97
Limestone	2	99
"Soapstone" (shale)	10	109
Sandstone	1	110
Shale, clayey	12	122
Shale and "slate" (hard, laminated shale)	13	135
Sandstone, hard (Pleasantview)	45	180
Shale (includes horizon of coal No. 2)	11	191
"Stone, siliceous, hard" (Seahorne limestone)	4	195
Shale, sandy	7	202
"Slate"	10	212
Mississippian system		
Iowa series		
Meramec group		
Salem formation		
Limestone, hard	8	220
Osage group		
Warsaw formation		
Shale	20	240
Limestone and shale	10	250
Shale, very hard	31	281
"Iron sulfuret"	1	282
Keokuk formation		
Limestone and shale	2	284
Limestone	6	290
Shale	1	291
Limestone, hard	21	312

[7] Log published in Illinois Geol. Survey vol. VII, pp. 11-12, 1883, wherein boring is reported to be near Winchester, but recent studies demonstrate it must be near Manchester.

[8] Estimated from Winchester quadrangle topographic map.

5. Roodhouse city well,[9] SW. corner NE. ¼ Sec. 32, T. 13 N., R. 12 W., Scott County, Illinois

Elevation 520-540 feet[10]

	Thickness Feet	Depth Feet
Mississippian system		
Iowa series		
Osage group		
Keokuk and Burlington formations		
Limestone, hard	89	89
Limestone, white, chalky, soft	84	173
Kinderhook group		
Hannibal formation		
Shale, blue	4	177

6. Crucible Oil and Refining Company test well,[11] E. C. Adams No. 1, NE corner SE. ¼ SW. ¼ Sec. 26, T. 13 N., R. 13 W., Scott County, Illinois

Elevation 604 feet[12]

Pleistocene system		
"Soil" (loess and till)	80	80
Mississippian system		
Iowa series		
Osage group		
Keokuk and Burlington formations		
Limestone, yellow	15	95
Limestone, white	50	145
Kinderhook group		
Hannibal formation		
Shale, blue	130	275
Sweetland Creek formation		
Shale, black	20	295
Shale, blue	25	320
Silurian system		
Niagaran series		
Limestone, white (oil show at 328 feet)	136	456
Ordovician system		
Cincinnatian series		
Maquoketa group		
Shale, blue	56	512
Shale, black	16	528
Shale, blue	65	593
"Slate," dark	15	608
Shale, blue	12	620
Limestone, brown, shale, and "slate"	14	634
Mohawkian and Chazyan series		
Kimmswick, Decorah, and Plattin (Mohawkian) and Joachim (Chazyan) formations		
Limestone, dark and light (oil shows at 650 and 878 feet)	273	907

7. A. L. McClay farm well No. 2,[13] SW. ¼ SW. ¼ Sec. 14, T. 12 N., R. 13 W., Greene County, Illinois

Elevation 443 feet[13]

Pleistocene system		
"Soil" (loess and till)	40	40
Sand and gravel	6	46

[9] Driller's log.
[10] Estimated from Winchester quadrangle topographic map.
[11] Log provided by C. E. Dice, driller.
[12] Elevation determined by A. H. Bell.
[13] Log obtained and elevation determined by D. M. Collingwood.

	Thickness Feet	Depth Feet
Mississippian system		
Iowa series		
Kinderhook group		
Hannibal formation		
"Soapstone" (shale)	89	135
Sweetland Creek formation		
Shale, black	25	160
"Soapstone" (shale)	25	185
Silurian system		
Niagaran series		
Limestone, gray and white; gas and water at 205 feet	45	230
Ordovician system		
Cincinnatian series		
Maquoketa group		
"Soapstone" (shale)	68	298
Limestone, dark	14	312
Shale, green	104	416
Mohawkian and Chazyan series		
Kimmswick, Decorah, Plattin (Mohawkian) and Joachim (Chazyan) formations		
Limestone	284	700
"Caprock"	5	705
"Oil sand" (dolomite, porous); oil "show" at 705-720 feet	45	750
Limestone	50	800

8. A. L. McClay farm well No. 1,[14] SE. ¼ SW. ¼ Sec. 23, T. 12 N., R. 13 W., Greene County, Illinois
Elevation 657 feet[15]

Pleistocene system		
Drift	80	80
Mississippian system		
Iowa series		
Osage group		
Burlington formation		
Limestone	25	105
Kinderhook group		
Hannibal and Sweetland Creek formations		
"Cave"	2	107
"Slate" (shale)	180	287

9. A. A. Coker farm well,[16] SW. corner E. ½ SW. ¼ NE. ¼ Sec. 24, T. 12 N., R. 13 W., Greene County, Illinois
Elevation 644± feet[17]

Pleistocene system		
Drift	40	40
Pennsylvanian system		
"Fireclay" (shale)	30	70
Mississippian system		
Iowa series		
Osage group		
Keokuk and Burlington formations		
"Rock" (limestone)	100	170

[14] Log provided by A. L. McClay.
[15] Elevation determined by D. M. Collingwood.
[16] Log provided by A. A. Coker.
[17] Elevation determined by E. G. Rehnquist.

10. M. Thomas farm well, NW. ¼ SE. ¼ Sec. 24, T. 12 N., R. 13 W., Greene County, Illinois
Elevation 656 feet[18]

	Thickness Feet	Depth Feet
Pleistocene and Pennsylvanian systems		
"Soil" (loess and drift of Pleistocene system; shale of Pennsylvanian system)	90	90
Mississippian system		
Iowa series		
Osage group		
Keokuk and Burlington formations		
Limestone	110	200

11. Chicago and Alton Railroad Company well at Roodhouse,[19] NE. ¼ SE. ¼ Sec. 13, T. 12 N., R. 12 W., Greene County, Illinois
Elevation 649 feet[20]

Pleistocene system		
Clay, yellow	55	55
Clay, sandy	8	63
Clay, blue	10	73
Pennsylvanian system		
"Soapstone" (shale)	14	87
Coal (No. 4)	2	89
"Fireclay" (underclay)	5	94
"Trap rock"	16	110
Shale	19	129
"Slate" (hard, laminated shale) and coal (No. 2)	3	132
"Fireclay" (underclay)	3	135
"Soapstone" (shale)	2	137
Mississippian system		
Iowa series		
Osage group		
Keokuk and Burlington formations		
"Flint" (chert), blue	2	139
Limestone	11	150
"Sandstone" (cherty limestone with possibly some siltstone)	100	250
Limestone	102	352
Kinderhook group		
Hannibal formation		
"Slate" (shale), blue	148	500
Sweetland Creek formation		
Shale, black	15	515
"Slate" (shale, laminated?, hard?), blue	37	552
Silurian system		
Niagaran series		
"Flint rock" (cherty limestone)	4	556
Limestone	116.5	672.5

12. Shaft and boring near Roodhouse,[21] NW. ¼ NE. ¼ Sec. 24, T. 12 N., R. 12 W., Greene County, Illinois
Elevation 655± feet[22]

Pleistocene system		
Soil, clay, and gravel	75	75

[18] Elevation determined by D. M. Collingwood.
[19] Driller's log supplied by H. T. Douglas, Jr., Chief Engineer, Chicago and Alton Railroad.
[20] Elevation determined by D. M. Collingwood.
[21] Published in Illinois Geol. Survey vol. VII, pp. 3, 12, 1883.
[22] Elevation determined by D. M. Collingwood.

	Thickness Feet	Depth Feet
Pennsylvanian system		
Shale, clayey, blue and ash-colored	15	90
"Slate" (shale, hard, laminated), black	1.3	91.3
Coal (No. 2)	2.3	93.6
"Fireclay" (underclay) and shale, clayey	18	111.6
Interval, may include or be	32	143.6
Mississippian system		
Iowa series		
Osage group		
Keokuk formation		
Limestone		143.6

13. Seely well, NE. ¼ NE. ¼ Sec. 31, T. 12 N., R. 12 W., Greene County, Illinois
Elevation 603 feet[23]

Pleistocene system		
Not reported	35±	35±
Pennsylvanian system		
"Potter's clay" (shale), whitish	25±	60±
Coal	1	61±
Clay, blue	17±	78
Mississippian system		
Iowa series		
Osage group		
Keokuk and Burlington formations		
Limestone, gray to white	62	140
Limestone, white	105	245
Kinderhook group		
Hannibal formation		
"Limestone" (hard shale), blue	60	305
Shale, blue	80	385
Sweetland Creek formation		
Shale, black	23	408
Shale, blue	27	435
Silurian system		
Niagaran series		
Limestone, white	66	501

14. Eugene Knight farm well,[24] NE. corner SW. ¼ Sec. 34, T. 12 N., R. 12 W., Greene County, Illinois
Elevation 570± feet[25]

Pleistocene system		
Drift	30	30
Mississippian system		
Iowa series		
Osage group		
Keokuk and Burlington formations		
"Rock" (limestone)	145	175

15. Griswold well,[26] SE. ¼ NE. ¼ NW. ¼ Sec. 35, T. 12 N., R. 12 W., Greene County, Illinois
Elevation 580 feet[26]

Pleistocene system		
Surface and clay	60	60

[23] Elevation determined by D. M. Collingwood.
[24] Log reported by driller.
[25] Elevation estimated from Roodhouse quadrangle topographic map.
[26] Log obtained and elevation determined by D. M. Collingwood.

	Thickness Feet	Depth Feet
Pennsylvanian system		
Sandstone	15	75
Mississippian system		
Iowa series		
Osage group		
Keokuk formation		
Limestone, blue, with some chert	25	100
Limestone, light grayish, with less chert	36	136

16. Ice-plant well,[27] White Hall, SE. ¼ NE. ¼ Sec. 35, T. 12 N., R. 12 W., Greene County, Illinois
Elevation 575 feet[28]

Pleistocene and Pennsylvanian systems		
Undifferentiated	80	80
Mississippian system		
Iowa series		
Osage group		
Keokuk and Burlington formations		
Limestone	275	355
Kinderhook group		
Hannibal formation		
Shale	115	470
Sweetland Creek formation		
Shale, black	35	505
Silurian system		
Niagaran series		
Limestone	190	695
Ordovician system		
Cincinnatian series		
Maquoketa group		
Shale	100	795
Mohawkian and Chazyan series		
Kimmswick, Decorah, and Plattin (Mohawkian) and Joachim (Chazyan) formations		
Limestone, sandy	429	1224
Chazyan series		
St. Peter formation		
Sandstone	250	1474

17. J. S. Hopkins farm well,[29] SW. corner NE. ¼ Sec. 16, T. 12 N., R. 11 W., Greene County, Illinois
Elevation 625 feet[30]

Pleistocene system		
Clay (soil, loess, and till)	28	28
"Hardpan" (till)	24	52
Gravel	2	54
Pennsylvanian system		
Clay (shale), blue	7	61
"Fireclay" (underclay)	12	73
Sandstone	6	79
"Soapstone" (shale)	6	85
Clay (shale), blue, "rubbery"	18	103
"Slate" (shale, hard, laminated), and coal (No. 2), with water	5	108
"Fireclay" (underclay)	12	120

[27] Driller's log obtained by R. S. Blatchley.
[28] Elevation determined by D. M. Collingwood.
[29] Log reported by J. S. Hopkins.
[30] Elevation determined by D. M. Collingwood.

	Thickness Feet	Depth Feet
Mississippian system		
Iowa series		
Osage group		
Warsaw formation		
Limestone, white	14	134
"Soapstone" (shale)	21	155
Keokuk and Burlington formations		
Sandstone, with water	14	169
Limestone, "bastard"	46	215
Limestone, white	37	252
Limestone	12	264
Limestone, white	32	296
Limestone, white, soft	38	334
Limestone, white, with water	11	345
Clay (shale?)	1	346
Limestone, white	6	352

18. W. M. Winter farm well,[31] S. ½ NE. ¼ NW. ¼ Sec. 2, T. 11 N., R. 12 W., Greene County, Illinois
Elevation 564 feet[32]

Pleistocene system		
Drift	50	50
Mississippian system		
Iowa series		
Osage group		
Keokuk and Burlington formations		
Limestone	152	202

19. C. I. McCollister (?) farm well,[33] center NW. ¼ Sec. 10, T. 11 N., R. 12 W., Greene County, Illinois
Elevation 574 feet[33]

Pleistocene system		
Undifferentiated	30	30
Mississippian system		
Iowa series		
Osage group		
Burlington formation		
Limestone, shaly, with blue chert	120	150

20. H. Baines farm well,[34] SW. corner SE. ¼ Sec. 14, T. 11 N., R. 12 W., Greene County, Illinois
Elevation 518 feet[34]

Mississippian system		
Iowa series		
Osage group		
Burlington or Sedalia formation		
Limestone, with fresh water	30	30
Kinderhook group		
Hannibal formation		
Shale	113	143

[31] Log provided by W. M. Winter.
[32] Elevation determined by D. M. Collingwood.
[33] Log obtained and elevation determined by D. M. Collingwood.
[34] Log obtained and elevation determined by D. M. Collingwood.

	Thickness Feet	Depth Feet
Silurian system		
Niagaran series		
Limestone	150	293
Ordovician system		
Cincinnatian series		
Maquoketa group		
Shale	10	303

21. G. C. Tunison (?) farm well,[35] NE. corner Sec. 15, T. 11 N., R. 12 W., Greene County, Illinois
Elevation 559 feet[35]

Mississippian system		
Iowa series		
Osage group		
Burlington (and Sedalia?) formations		
Limestone, cherty, blue, and limestone, magnesian, brown	130—	130—
Kinderhook group		
Hannibal formation		
Shale, blue	?	130

22. Potts farm well,[36] SW. ¼ NE. ¼ Sec. 17, T. 11 N., R. 12 W., Greene County, Illinois
Elevation 569 feet[37]

Pleistocene system		
"Soil" (includes drift)	30	30
Mississippian system		
Iowa series		
Osage group		
Burlington or Sedalia formation		
Limestone, yellow, rotten	15	45
Kinderhook group		
Hannibal formation		
Shale, blue-gray, soft and hard, with rotten streaks, cavy	105	150
Silurian system		
Niagaran series		
Limestone, white	155	305
Ordovician system		
Cincinnatian series		
Maquoketa group		
Shale	10	315
Shale, black	45	360
Limestone, gray	5	365
Limestone, cherty?, "dirty," dark gray, hard	30	395
Salt water		400

[35] Log obtained and elevation determined by D. M. Collingwood.
[36] Log provided by C. E. Dice, driller.
[37] Elevation determined by D. M. Collingwood.

23. S. Edwards farm well,[38] NE. ¼ SE. ¼ Sec. 21, T. 11 N., R. 12 W., Greene County, Illinois

Elevation 544 feet[38]

	Thickness Feet	Depth Feet
Mississippian system		
Iowa series		
Osage group		
Keokuk and Burlington formations		
Unreported	177	177
Limestone	50	227
Kinderhook group		
Hannibal formation		
Shale, black	4	231

24. George Berline farm well,[39] SE. corner NE. ¼ SW. ¼ Sec. 1, T. 11 N., R. 13 W., Greene County, Illinois

Elevation 615 feet[40]

Pleistocene system		
Drift	80	80
Mississippian system		
Iowa series		
Osage group		
Keokuk and Burlington formations		
Limestone	139	219

25. Hartwell Ranch well, SW. ¼ NW. ¼ Sec. 9, T. 11 N., R. 13 W., Greene County, Illinois

Elevation 444 feet

Pleistocene system		
Drift	45	45
Devonian and Silurian systems		
Senecan (Devonian) and Niagaran (Silurian) series		
Limestone	68	113
Ordovician system		
Cincinnatian series		
Maquoketa group		
"Slate"	40	153
"Coal" (probably black shale)	10	163
Shale	152	315

26. O. R. Smith farm well,[41] SE. corner SW. ¼ SW. ¼ Sec. 34, T. 10 N., R. 13 W., Greene County, Illinois

Elevation 650± feet[42]

Pleistocene system		
Drift	58	58
Mississippian system		
Iowa series		
Osage group		
Warsaw (?) formation		
"Shelly rock"	10	68
Keokuk and Burlington formations		
Limestone	100	168

[38] Log obtained and elevation determined by D. M. Collingwood.
[39] Log provided by George Berline.
[40] Elevation estimated from Roodhouse quadrangle topographic map.
[41] Log provided by O. R. Smith.
[42] Elevation estimated from Pearl quadrangle topographic map.

27. C. L. Watson farm well, SE. ¼ SE. ¼ Sec. 35, T. 10 N., R. 13 W., Greene County, Illinois

Elevation 615± feet

	Thickness Feet	Depth Feet
Pleistocene system		
Drift	52	52
Mississippian system		
Iowa series		
Osage group		
Keokuk and Burlington formations		
Limestone	213	265
Kinderhook group		
Hannibal formation		
"Slate" (hard shale)	47	312

28. Kerback farm well,[43] SE. ¼ NE. ¼ Sec. 3, T. 10 N., R. 12 W., Greene County, Illinois

Elevation 593 feet[43]

Pleistocene system		
Unreported	19	19
Pennsylvanian system		
Sandstone	10	29
Unreported (shale?)	36	65
Mississippian system		
Iowa series		
Osage group		
Keokuk and Burlington formations		
Limestone, white	155	220

29. Hough house well,[44] one block north of city square, Carrollton, E. ½ NE. ¼ NE. ¼ Sec. 22, T. 10 N., R. 12 W., Greene County, Illinois

Elevation 610 feet[44]

Pleistocene system		
Drift	40	40
Pennsylvanian system		
Unreported	35	75
Coal	1.5	76.5
Mississippian system		
Iowa series		
Osage group		
Keokuk and Burlington formations (includes some Pennsylvanian system at top)		
Unreported; bottom is shaly limestone with fresh water (probably near contact of Burlington and Hannibal formations)	173.5	250

30. Carrollton city well,[45] center Sec. 22, T. 10 N., R. 12 W., Greene County, Illinois

Elevation 606 feet[46]

Pleistocene system		
"Surface"	1.5	1.5
Clay (loess and drift?)	16.5	18
"Black soil" (drift?)	32	50

[43] Log obtained and elevation determined by D. M. Collingwood.
[44] Log obtained and elevation determined by D. M. Collingwood.
[45] Driller's log.
[46] Elevation determined by D. M. Collingwood.

	Thickness Feet	Depth Feet
Clay, yellow	1	51
Clay, red	8	59
Sand	.5	59.5
Pennsylvanian system		
"Slate" (shale)	10.5	70
Mississippian system		
Iowa series		
Osage group		
Keokuk and Burlington formations		
Limestone	129	199
Limestone and "flint" (chert)	101	300
Kinderhook group		
Hannibal formation		
Limestone and sandstone	80	380
"Slate" (shale)	25	405
Sweetland Creek formation		
Shale, black	95	500
Devonian system		
Senecan series		
Limestone and shale, black	30	530
Silurian system		
Niagaran series		
Limestone	100	630
Limestone and "flint" (chert)	98	728
Ordovician system		
Cincinnatian series		
Maquoketa group		
"Slate" (shale)	172	900
Mohawkian series		
Kimmswick formation		
Limestone and "slate" (shale)	74	974
Limestone, "flint-rock" (chert), and "slate" (shale)	24	998
Decorah formation		
"Slate" (shale)	7	1005
Plattin formation		
Limestone, "flint" (chert), and "slate" (shale)	20	1025
Limestone and "slate" (shale)	20	1045
"Flint-rock" (cherty limestone) and "slate" (shale)	70	1115
Limestone and "flint-rock" (chert)	60	1175
Chazyan series		
Joachim formation		
Limestone and shale	15	1190
Limestone	15	1205
Sandstone, salt water	28	1233
Limestone	2	1235
St. Peter formation		
Sandstone	92	1327

31. Carrollton Community well,[47] SE. corner NW. ¼ Sec. 26, T. 10 N., R. 12 W., Greene County, Illinois

Elevation 595 feet

Pleistocene system		
Soil	.5	.5
Clay, yellow	35.5	36
Gravel	4	40
Clay (till), calcareous, bluish-gray	32	72

[47] Log derived from samples of well cuttings studied by L. E. Workman.

	Thickness Feet	Depth Feet
Mississippian system		
Iowa series		
Meramec group		
Salem formation		
Limestone, yellowish-brown to light buff-gray, medium granular; contains numerous *Endothyra*	8	80
Dolomite, argillaceous, very finely sandy, grayish-brown, very finely crystalline, slightly micaceous and glauconitic	45	125
Osage group		
Warsaw formation		
Shale, dolomitic, gray, geodiferous at bottom	60	185
Keokuk and Burlington formations		
Limestone, very cherty, dolomitic, brownish-gray speckled dark gray and brown, very coarsely granular; chert bluish	14	199
Limestone, very cherty, dolomitic, buff and gray speckled dark gray, very coarsely to medium granular	47	246
Limestone, cherty, light buff, coarsely granular, semi-crystalline, compact; contains some glauconite	32	278
Limestone, cherty, dolomitic, white, very coarsely granular, semi-crystalline; contains an occasional grain of glauconite	29	307
Dolomite, cherty, white, very finely crystalline, porous	43	350
Limestone, cherty, white, coarsely granular, semi-crystalline	85	435
Kinderhook group		
Hannibal formation		
Shale, very silty, greenish-gray	115	550
Shale, silty, dark gray	18	568
Sweetland Creek formation		
Shale, silty, micaceous, dark brown, tough; contains *Sporangites*	17	585
Shale, gray, weak	26	611
Devonian system		
Senecan series		
Sandstone, brownish-gray, very fine-grained; limestone, sandy, buff	19	630
Silurian system		
Niagaran series		
Limestone, very cherty, dolomitic, light brown, very fine-grained	15	645
Limestone, light gray, lithographic	10	655
Limestone, white and light gray, sublithographic	61	716
Dolomite, white, finely crystalline	12	728
Limestone, cherty, light buff to white with pink grains, very finely granular with scattered coarse, pink grains	22	750

32. Scheljon Bros. (?) farm well,[48] NE. ¼ NW. ¼ Sec. 30, T. 10 N., R. 12 W., Greene County, Illinois

Elevation 568 feet[48]

Pleistocene system		
Surficial material	30	30

[48] Log obtained and elevation determined by D. M. Collingwood.

	Thickness Feet	Depth Feet
Mississippian system		
Iowa series		
Osage group		
Warsaw formation		
"Soapstone" (shale)	10	40
Keokuk formation		
"Flint-rock" (cherty limestone), blue	91	131

33. Vedder farm well,[49] SW. ¼ NW. ¼ Sec. 30, T. 10 N., R. 12 W., Greene County, Illinois

Elevation 570 feet[50]

Pleistocene system		
Drift	19	19
Mississippian system		
Iowa series		
Osage group		
Warsaw formation		
Shale	14	33
Keokuk formation		
Limestone	80	113

34. Jehosaphat Eldred farm well,[51] NE. corner SE. ¼ SE. ¼ Sec. 31, T. 10 N., R. 12 W., Greene County, Illinois

Elevation 570 feet[52]

Pleistocene system		
Drift	42	42
Mississippian system		
Iowa series		
Osage group		
Warsaw formation		
Shale	15	57
Keokuk and Burlington formations		
Limestone	140	197

35. Burruss well,[53] NW. corner SW. ¼ NE. ¼ Sec. 15, T. 10 N., R. 11 W., Greene County, Illinois

Elevation 630± feet[54]

Pleistocene system		
Soil	3	3
Clay, white (loess)	2	5
Clay, yellow (loess)	14	19
"Hardpan" (till), yellow	5	24
"Hardpan" (till), blue	5	29
Clay (till?), yellow	11	40
Pennsylvanian system		
Shale, red	4	44
Shale, black, with 1 inch of coal	1	45
Limestone	2	47
Shale, blue, and sandstone, in strata	108	155
Coal (No. 2)	1±	156
Shale, blue	4	160

[49] Log provided by Mr. Vedder.
[50] Elevation estimated from Roodhouse quadrangle topographic map.
[51] Log provided by Jehosaphat Eldred.
[52] Elevation estimated from Roodhouse quadrangle topographic map.
[53] Log provided by J. C. Burruss.
[54] Elevation estimated from Roodhouse quadrangle topographic map.

	Thickness Feet	Depth Feet
Mississippian system		
Chester series (may be Pennsylvanian system)		
Shale, white	6	166
Shale, red	12	178
Shale, green	2	180
Shale, blue	30	210
Iowa series		
Meramec group		
St. Louis formation		
"Rock" (limestone), white	10	220
Salem formation		
Shale and sandstone (probably sandy dolomite)	50	270
"Rock" (limestone or dolomite)	10	280
Shale and sandstone as above	20	300
Osage group		
Warsaw formation		
Limestone and "flint" (chert) mixed with thin strata of shale	65	365
Shale, blue	3	368
Keokuk and Burlington formations		
Limestone and "flint" (chert)	232	600
Kinderhook group		
Hannibal formation		
"Sand rock" (probably silty shale and siltstone)	100	700
Sweetland Creek formation		
Shale, bituminous	30	730
Shale, soft	10	740
Devonian system		
Senecan series		
Sandstone	5	745

36. Jacob G. Pope well,[55] SW. ¼ NE. ¼ Sec. 19, T. 9 N., R. 11 W., Greene County, Illinois

Elevation 486 feet[55]

Pleistocene, Mississippian, and Silurian systems and Maquoketa group of Ordovician system		
Undifferentiated (no black or chocolate shale, showing absence of Sweetland Creek formation)	810	810
Ordovician system		
Mohawkian and Chazyan series		
Kimmswick, Decorah, Plattin (Mohawkian) and Joachim (Chazyan) formations; oil show at 850 feet	327	1137
Chazyan series		
St Peter formation		
Sandstone	50	1187

37. Harry Varble well,[56] SW. corner SE. ¼ SE. ¼ Sec. 30, T. 9 N., R. 11 W. Greene County, Illinois

Elevation 567 feet

Pleistocene system		
Drift	30	30
Mississippian system		
Iowa series		
Osage group		
Keokuk and Burlington formations		
Limestone	220	250

[55] Log obtained and elevation determined by D. M. Collingwood.
[56] Log provided by Harry Varble.

38. Kane schoolhouse well,[57] NW. ¼ NW. ¼ Sec. 32, T. 9 N., R. 11 W., Greene County, Illinois
Elevation 553 feet[57]

	Thickness Feet	Depth Feet
Pleistocene system		
(Clay?)	30	30
Hardpan	20	50
Mississippian system		
Iowa series		
Osage group		
Warsaw formation		
"Rock" (limestone or hard shale)	10	60
"Soapstone" (shale)	30	90
Keokuk formation		
Limestone	48	138

39. P. A. Kimball farm well,[58] SE. ¼ NW. ¼ Sec. 15, T. 9 N., R. 13 W., Greene County, Illinois
Elevation 670± feet[59]

Pleistocene system		
Drift	33	33
Mississippian system		
Iowa series		
Osage group		
Burlington formation		
"Flint rock" (cherty limestone)	70	103
Kinderhook group		
Chouteau formation		
"Sand rock" (dolomite)	30	133

40. A. Wheaton farm well No. 1,[60] SW. ¼ NE. ¼ Sec. 27, T. 8 N., R. 13 W., Jersey County, Illinois
Elevation 690± feet[61]

Pleistocene system		
Drift	40	40
"Rock"	40	80
Gravel	17	97
Mississippian system		
Iowa series		
Osage group		
Burlington formation		
"Rock" (limestone)	5	102

41. A. Wheaton farm well No. 2,[62] SE. corner SW. ¼ Sec. 27, T. 8 N., R. 13 W., Jersey County, Illinois
Elevation 600± feet[63]

Pleistocene system		
Drift (?)	120	120

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57 Log obtained and elevation determined by D. M. Collingwood.
58 Log provided by R. M. Davidson.
59 Elevation estimated from Hardin quadrangle topographic map.
60 Log provided by A. Wheaton.
61 Elevation estimated from Hardin quadrangle topographic map.
62 Log provided by A. Wheaton; location of well not certain.
63 Elevation of assumed location estimated from Hardin quadrangle topographic map.

	Thickness Feet	Depth Feet
Mississippian system		
Iowa series		
Kinderhook group		
Hannibal formation		
Shale	15	135
Devonian and Silurian systems (may include Louisiana formation of Mississippian system)		
Limestone	193	328

42. Ice-plant well at Jerseyville, Sec. 21, T. 8 N., R. 11 W., Jersey County, Illinois
Elevation 640± feet[64]

Pleistocene and Pennsylvanian systems		
Drift; shale at bottom	125	125
Mississippian system		
Iowa series		
Osage group		
Limestone	300	425
Kinderhook group		
Hannibal formation		
Shale	125	550
Devonian system		
Senecan series		
Limestone	80	620

43. Jerseyville city well No. 2, NW. corner Sec. 28, T. 8 N., R. 11 W., Jersey County, Illinois
Elevation 646.2 feet[65]

Pleistocene system		
Clay and gravel	26	26
Pennsylvanian system		
"Slate" (shale), black	74	100
Mississippian system		
Iowa series		
Meramec group		
Salem formation		
Limestone, "flinty" (cherty)	16	116
"Slate" (argillaceous limestone)	24	140
Limestone	5	145
Osage group		
Warsaw formation		
"Slate" (shale)	23	168
Limestone	12	180
"Slate" (shale)	27	207
Keokuk and Burlington formations		
Limestone	10	217
"Slate" (shale)	4	221
Limestone	229	450
Fern Glen-Sedalia formation		
"Flint" (cherty limestone)	30	480
Kinderhook group		
Chouteau formation		
Limestone	50	530
Hannibal formation		
"Slate" (shale)	25	555

64 Elevation estimated from Jerseyville quadrangle topographic map.
65 Elevation determined by D. M. Collingwood.

	Thickness Feet	Depth Feet
Limestone	10	565
"Slate" (shale)	10	575
Devonian system		
Senecan series		
Limestone, conglomeratic, hard	65	640
"Slate" (shale)	10	650
Silurian system		
Niagaran and Alexandrian (?) series		
Lime and "flint" (chert)	160	810
Ordovician system		
Cincinnatian series		
Maquoketa group		
"Slate" (shale)	80	890
Limestone, gray	50	940
Shale	35	975
Mohawkian series		
Kimmswick formation		
Limestone	65	1040
Limestone, salt water	40	1080
Decorah and Plattin formations		
Limestone	235	1315
Chazyan series		
Joachim formation		
Limestone, contains mud seams	35	1350
Limestone, with sand	12	1362
St. Peter formation		
Sandstone	180	1542

44. Richard Gilham farm well,[66] SE. corner SW. ¼ Sec. 28, T. 7 N., R. 11 W., Jersey County, Illinois

Elevation 740 feet[66]

Pleistocene system		
Surface material and gravel	105	105
Pennsylvanian system and Salem and Warsaw formations of Mississippian system		
Shale, blue	155	260
Mississippian system		
Iowa series		
Osage group		
Keokuk and Burlington formations		
Rock (limestone)	290	550
Kinderhook group		
Chouteau and Hannibal formations		
"Sand rock" (dolomitic limestone and silty shale)	50	600
Devonian and Silurian systems and Maquoketa group of Ordovician system		
"Sand rock" (sandy shale, sandy limestone, and dolomite)	300	900
Ordovician system		
Cincinnatian series		
Maquoketa group		
Shale	10	910
Mohawkian and Chazyan series		
Kimmswick, Decorah and Plattin (Mohawkian) and Joachim, and St. Peter (Chazyan) formations		
"Hard rock" (limestone and sandstone)	890	1800

[66] Log obtained and elevation determined by D. M. Collingwood.

45. Winters Bros., Morrow, and Dice, oil-test well, Mary McDow No. 1,[67] SW. corner NE. ¼ NW. ¼ Sec. 32, T. 7 N., R. 11 W., Jersey County, Illinois

Elevation 665± feet[68]

	Thickness Feet	Depth Feet
Pleistocene system		
Soil	38	38
Mississippian system		
Iowa series		
Meramec group		
Salem formation		
Limestone, yellow, "rotten" (soft)	17	55
Limestone, gray	15	70
Osage group		
Warsaw formation		
Shale, blue	53	123
Keokuk, Burlington, and Fern Glen formations		
Limestone, blue cherty	82	205
Limestone, white, very cherty	207	412
Kinderhook group		
Chouteau formation		
Limestone, dark gray	28	440
Hannibal formation		
Shale, blue	28	468
Sweetland Creek formation		
Shale, black	18	486
Devonian system		
Senecan series		
Limestone, gray	5	491
Shale, brown	10	501
Limestone, gray	12	513
Shale, sandy	1	514
Silurian system		
Niagaran and Alexandrian series		
Limestone, gray	23	537
Limestone, white	40	577
"Sand" (dolomite), salt water	62	639
Ordovician system		
Cincinnatian series		
Maquoketa group		
Shale, blue	141	780
Limestone, brown, and shale	20	800
Shale, blue, and limestone, sandy	8	808
Mohawkian series		
Kimmswick formation		
Limestone, brown	43	851
Limestone, white	36	887

46. Dr. J. Tidball's farm well, SE. ¼ SW. ¼ Sec. 23, T. 7 N., R. 12 W., Jersey County, Illinois

Elevation 522 feet[69]

Pleistocene system		
Soil, gravel, and quicksand	30	30
Loose rock and mud	20	50

[67] Driller's log.
[68] Elevation estimated from Jerseyville quadrangle topographic map.
[69] Elevation determined by D. M. Collingwood.

	Thickness Feet	Depth Feet
Mississippian system		
Iowa series		
Osage group		
Keokuk and Burlington formations		
Limestone, hard, cherty	125	175
Kinderhook group		
Chouteau formation		
Limestone, white	25	200
Chouteau or Hannibal formation		
Shale, gray	15	215
Hannibal formation		
Shale, gray, soft	73	288
Devonian system		
Senecan series		
"Shell" (shaly limestone), hard	4	292
"Slate" (hard shale)	2	294
"Shell" (shaly limestone), hard	4	298
Silurian system		
Niagaran and Alexandrian series		
Limestone, white	56	354
Lime sand	12	366
Limestone, white	34	400
Ordovician system		
Cincinnatian series		
Maquoketa group		
"Soapstone" (shale), white	140	540
Mohawkian series		
Kimmswick formation		
Sulphur and salt water	100	640
Decorah formation		
Limestone, soft, yellow	25	665
Plattin formation		
Limestone, hard, yellow	20	685
Limestone, brown	35	720
Limestone, white	160	880
Chazyan series		
Joachim formation		
Limestone, gray	17	897

47. J. T. Elmore and Company oil-test well,[70] Bell No. 1, NE. ¼ SE. ¼ Sec. 33, T. 7 N., R. 12 W., Jersey County, Illinois

Elevation 770± feet[71]

Pleistocene system		
Silt (loess), brown, weathered	55	55
Silt (loess), sandy, calcareous, buff	25	80
Mississippian system		
Iowa series		
Osage group		
Keokuk and Burlington formations		
Chert, white and yellow with dark spots	45	125
Limestone, very cherty, white to buff, coarsely to very coarsely granular; chert white	20	145
Limestone, dolomitic, very cherty, light buff, finely crystalline; chert white	15	160
Limestone, dolomitic, cherty, white, very coarsely granular; chert white	40	200
Limestone, dolomitic, cherty, light buff, very finely crystalline to very coarsely granular	15	215

[70] Log derived from samples of cuttings studied by L. E. Workman.
[71] Elevation estimated from Jerseyville quadrangle topographic map.

	Thickness Feet	Depth Feet
Fern Glen formation		
Limestone, slightly argillaceous, dolomitic, cherty, light gray, green, and buff, coarse limestone grains in finely crystalline dolomitic matrix; chert light bluish-gray	30	245
Limestone, dolomitic, cherty, white to light buff with light green tint, coarsely granular; chert white	30	275
Kinderhook group		
Chouteau formation		
Limestone, dolomitic, cherty, brownish-gray, coarse grains in very finely granular matrix	45	320
Hannibal formation		
Siltstone and shale, calcareous, gray, weak	5	325
Sweetland Creek formation		
Shale, silty, dark gray and dark brown, tough; contains many *Sporangites* at bottom	30	355
Devonian system		
Senecan series		
Limestone, very dolomitic, sandy, silty, grayish-brown with dark gray spots, very finely crystalline	10	365
Silurian system		
Niagaran and Alexandrian series		
Dolomite, mottled light and medium gray, very finely crystalline, vesicular	55	420
Dolomite, glauconitic, mottled light and medium gray with slight greenish tint, finely crystalline	15	435
Dolomite, cherty, white, very finely crystalline	20	455
Dolomite, coarsely oölitic, mottled light and medium gray, very finely crystalline (Noix oölite member of Edgewood formation of Alexandrian series)	5	460
Ordovician system		
Cincinnatian series		
Maquoketa group		
Shale, bluish-gray with dark brown to black bituminous specks; sandstone, argillaceous, dolomitic, dark bluish-gray, very fine-grained	140	600
Dolomite, very argillaceous, siliceous, dark grayish-brown, very finely crystalline; shale, dolomitic, brown and brownish-gray	15	615
Mohawkian series		
Kimmswick formation		
Limestone, dolomitic, buff, coarsely granular	102	717

48. T. Fraley farm well,[72] NE. ¼ SW. ¼ Sec. 13, T. 7 N., R. 13 W., Jersey County, Illinois

Elevation 690± feet[73]

Pleistocene system		
Drift	25	25
Mississippian system		
Iowa series		
Osage and Kinderhook groups		
Keokuk and Burlington, Fern Glen, and Chouteau formations		
Limestone	200?	225?

[72] Log provided by T. Fraley.
[73] Elevation estimated from Jerseyville quadrangle topographic map.

	Thickness Feet	Depth Feet
Kinderhook group		
Hannibal formation		
"Soapstone" (shale)	40	265?
Devonian and Silurian systems		
Senecan (Devonian) and Niagaran and Alexandrian (Silurian) series		
Limestone	58?	323

49. J. D Beirne well,[74] SE. corner Sec 3, T. 6 N., R. 12 W., Jersey County, Illinois
Elevation 670± feet[75]

	Thickness Feet	Thickness Inches	Depth Feet	Depth Inches
Pleistocene system				
Surface earth and blue clay	36	10	36	10
Mississippian system				
Iowa series				
Osage group				
Fern Glen formation				
Limestone with chert	1	3	38	1
"Cavity"	2		40	1
Limestone and "cavity"	1	8	41	9
Kinderhook group				
Chouteau formation				
Limestone, sandy, cherty, yellowish-gray	31	3	73	
Hannibal and Sweetland Creek formations				
Shale, blue; contains gas; lower part bituminous	33		106	
Devonian system				
Senecan series				
"Flint" (sandstone), blue		3	106	3
Shale (probably argillaceous limestone), blue	4	9	111	
Silurian system				
Niagaran and Alexandrian series				
Limestone, sandy (dolomitic?), cherty	11		122	
Limestone, sandy (dolomitic?), cherty, very hard; contains some oil	19		141	
"Flint" (chert), blue, and "limy sandstone" (dolomitic limestone?), saturated with oil	5		146	
Limestone, light yellow	9		155	
Limestone, sandy (dolomitic?)	8	4	163	4
"Sandstone, limy, hard, probably magnesium" (dolomite)	42	8	206	
Ordovician system				
Cincinnatian series				
Maquoketa group				
Shale, blue; smells of petroleum	53	5	259	5
Shale, dark brown and black, bituminous	18	5	277	10
Shale, dark brown and black, bituminous; show of oil	69	9	347	7
Sandstone, hard, and limestone, soft	6	10	354	5
Mohawkian series				
Kimmswick formation				
Limestone, light colored	43	2	397	7
Shale, sandy	5	10	403	5
Limestone	36	4	439	9

[74] Driller's log.
[75] Location not certain; elevation at assumed location estimated from St. Charles quadrangle topographic map.

	Thickness Feet	Thickness Inches	Depth Feet	Depth Inches
Decorah (?) formation				
Limestone, dark brown, crystalline, porous	4	10	444	7
Limestone, reddish-brown	14		458	7
Plattin formation				
Limestone, gray, hard	4	2	462	9
Limestone, bluish-gray	20	4	483	1
Limestone, soft	14	8	497	9
Limestone, light colored	122		619	9
Chazyan series				
Joachim formation				
Sandstone (?) bluish-brown	70		689	9
St. Peter formation				
Sandstone, white	60	10	750	7

50. H. H. Ferguson farm well,[76] NE. corner NW. ¼ SE. ¼ Sec. 8, T. 6 N., R. 12 W., Jersey County, Illinois

Elevation 480± feet[77]

	Thickness Feet	Depth Feet
Pleistocene system		
(Gravel)	12	12
Ordovician system		
Cincinnatian series		
Maquoketa group		
Clay, calcareous, yellow, and shale, silty dolomitic, gray	24	36
Shale, silty, micaceous, dark brown with black carbonaceous flakes; siltstone, argillaceous, slightly calcareous, brownish-gray to gray, firm; limestone, yellow, very fine-grained	54	90
Mohawkian series		
Kimmswick formation		
Limestone, partly dolomitic, light buff, very fine-grained with some coarse grains; shale, silty, slightly calcareous, brownish-gray, firm, in upper 30 feet; cherty in lower 30 feet	115	205
Decorah formation		
Limestone, brown, very fine-grained	15	220
Limestone, dolomitic, slightly cherty, light brown and buff, very coarsely granular; dolomite, argillaceous, gray, crystalline, finely granular; shale, dolomitic and calcareous, gray	20	240
Plattin formation		
Limestone, dolomitic, locally sandy, locally oölitic, locally cherty, light brownish-gray, lithographic to finely granular with some coarser grains; shale, calcareous and dolomitic, dark brown	145	385
Dolomite, brown, very finely granular, slightly vesicular; coarse sand grains	45	430
Chazyan series		
Joachim formation		
Dolomite, light greenish-gray and brownish-gray, very finely granular, grading through argillaceous dolomite to shale, dolomitic, dark brownish-gray	20	450

[76] Log derived from samples of well cuttings studied by L. E. Workman.
[77] Elevation estimated from St. Charles quadrangle topographic map.

	Thickness Feet	Depth Feet
Dolomite, sandy, brownish-gray, very finely granular; shale, sandy, gray and brown.....	30	480
Dolomite, sandy, very finely granular; sandstone, white, medium-grained; sandstone, dolomitic, gray, fine- to medium-grained.....	10	490
St. Peter formation		
Sandstone, white, very fine- to medium-grained..	35	525

51. Illinois Powder Manufacturing Company well[78] (at Glycerine Factory), center of north edge NW. ¼ NW. ¼ Sec. 13, T. 6 N., R. 12 W., Jersey County, Illinois

Elevation 598 feet[79]

Pleistocene system		
Clay	22	22
Mississippian system		
Iowa series		
Osage group		
Burlington formation		
Limestone	38	60
Fern Glen formation		
"Fireclay" (shale).....	3	63
Limestone	4	67
"Fireclay" (shale).....	2	69
Limestone	13	82
"Rock," red.....	3	85
Limestone	20	105
Shale	2	107
Kinderhook group		
Chouteau formation		
Limestone	38	145
Hannibal and Sweetland Creek(?) formations		
Shale	35	180
Devonian or Silurian system		
Senecan (Devonian) or Niagaran (Silurian) series		
Limestone	15	195
Limestone	5	200
Silurian system		
Niagaran series (may include Alexandrian series)		
Limestone, blue.....	60	260
Ordovician system		
Cincinnatian series		
Maquoketa group		
Shale	50	310

52. Illinois Powder Manufacturing Company well[80] (at office) NE. ¼ NW. ¼ NE. ¼ Sec. 14, T. 6 N., R. 12 W., Jersey County, Illinois

Elevation 483 feet[81]

Pleistocene system		
Clay (may include some shale of Hannibal formation, Mississippian system).....	34	34
Devonian and Silurian systems		
Senecan (Devonian) and Niagaran (Silurian) series		
Limestone, cherty, yellow, fine-grained.....	41	75

[78] Driller's log provided by Company.
[79] Elevation determined by D. M. Collingwood.
[80] Driller's log provided by company, supplemented by samples of well cuttings studied by J. A. Udden.
[81] Elevation determined by D. M. Collingwood.

	Thickness Feet	Depth Feet
Silurian system		
Niagaran and Alexandrian (?) series		
Limestone, light bluish, and dolomite, greenish-gray, glauconitic	85	160
Ordovician system		
Cincinnatian series		
Maquoketa group		
Shale, greenish, with dark gray dolomitic limestone reported at depths 252-264 feet	140	300
Mohawkian series		
Kimmswick formation		
Limestone, dark brown, yellow, and white with dark specks of marcasite	66	366
Limestone, yellowish-white	9	375
Decorah formation		
Limestone, gray, white, and dark; sandstone, calcareous, gray	39	414
Plattin formation		
Limestone, dolomitic, straw-colored, with some white chert	146	560
Chazyan series		
Joachim formation		
Limestone, gray, with greenish tint, slightly sandy; shale, dolomitic, black	25	585
Limestone, dolomitic, straw-colored, finely granular	20	605
Limestone, dolomitic, finely sandy, gray	50	655
St. Peter formation		
Sandstone, grains well assorted and well rounded, medium	117.5	772.5

53. Illinois Powder Manufacturing Company well[82] (500 feet northwest of nitric plant), near NE. corner NW. ¼ Sec. 14, T. 6 N., R. 12 W., Jersey County, Illinois
Elevation 550 feet[83]

Pleistocene and Mississippian systems		
Drift and clay (also reported to include Hannibal shale of Mississippian system)	43	43
Devonian and Silurian systems		
Senecan (Devonian) and Niagaran and Alexandrian ? (Silurian) series		
Limestone	127	170
Ordovician system		
Cincinnatian series		
Maquoketa group		
Shale and limestone	148	318
Mohawkian series		
Kimmswick, Decorah, and Plattin formations		
Limestone, blue	152	470

54. George Duncan farm well,[83] NE. corner SW. ¼ Sec. 6, T. 6 N., R. 11 W., Jersey County, Illinois
Elevation 670± feet[84]

Pleistocene system		
Soil	32	32

[82] Log provided by company.
[83] Elevation determined by D. M. Collingwood.
[84] Elevation estimated from St. Charles quadrangle topographic map.
[85] Driller's log.

	Thickness Feet	Depth Feet
Mississippian system		
Iowa series		
Osage group		
Warsaw formation		
Limestone, yellow, soft	12	44
Limestone, cherty, white	31	75
Shale, blue	8	83
Limestone, shaly, crumbly	2	85
Keokuk formation		
Limestone, cherty	70	155
Limestone, white	12	167

55. Housman and Shaffer test well, L. A. Achepohl No. 1,[85] NW. ¼ NE. ¼ SE. ¼ Sec. 26, T. 48 N., R. 5 E., St. Charles County, Missouri

Elevation 435± feet[86]

Pleistocene system		
Drift	20	20
Loess, sand, and gravel	105	125
Mississippian system		
Iowa series		
Meramec group		
St. Louis formation		
Limestone, gray	35	160
"Mud" (shale)	1	161
Limestone, brown	74	235
"Slate" (shale), blue	2	237
Limestone, white, hard	23	260
Salem formation		
Limestone, brown, soft	50	310
"Slate" (shale), blue	10	320
Limestone, brown	23	343
Osage group		
Warsaw formation		
"Slate" (shale), blue, soft	63	406
"Slate" (shale), brown	4	410
Keokuk and Burlington formations		
Limestone, brown, hard	15	425
Limestone, gray, hard	10	435
Limestone, "sandy" (cherty), white, hard	75	510
Limestone, white, hard	115	625
Fern Glen formation		
Limestone, dark, hard	55	680
Kinderhook group		
Chouteau formation (probably includes some of Fern Glen formation)		
Limestone, brown	70	750
Hannibal formation		
"Slate" (shale), blue	30	780
Devonian and Silurian systems		
Senecan (Devonian) and Niagaran and Alexandrian (?) (Silurian) series		
Limestone and sand	55	835
Ordovician system		
Cincinnatian series		
Maquoketa group		
"Slate" (shale), blue	140	975

[85] Driller's log.
[86] Elevation estimated from St. Charles quadrangle topographic map.

	Thickness Feet	Depth Feet
Mohawkian series		
Kimmswick and Decorah formations		
Limestone, brown, hard	50	1025
"Sand" (dolomite), brown, hard	60	1085
Limestone, brown, hard	5	1090
Mohawkian and Chazyan series		
Plattin (Mohawkian) and Joachim (Chazyan) formations		
Limestone, brown, hard	220	1310
Chazyan series		
Joachim formation		
Limestone, white, hard	10	1320
St Peter formation		
Sandstone, white, soft	248	1568
"Mud" (shale), blue, soft	19	1587
Prairie du Chien series		
Beekmantown group		
Powell, Cotter, and Jefferson City formations		
Limestone, sandy, white, soft	11	1598
Shale and limestone, blue and white, soft	27	1625
Limestone, gray, hard	6	1631
Shale, blue and gray	11	1642
Sandstone and limestone, gray and brown	362	2004

56. Maggos and Kost's Lindberg Park well No. 1,[87] NE. ¼ NW. ¼ Sec. 8, T. 5 N., R. 9 W., Madison County, Illinois

Elevation 445± feet[88]

Pennsylvanian (?) system		
Shale (reported by driller)	60	60
Mississippian system		
Iowa series		
Meramec group		
Ste. Genevieve formation		
Limestone, sandy, brownish-gray, coarsely granular and oölitic to lithographic, glauconitic; sandstone, coarse-grained	5	65
St. Louis formation		
Limestone, finely granular to lithographic, light gray to white	15	80
Limestone, cherty, white, very finely granular to sublithographic	12	92
Limestone, with green argillaceous partings, light gray, sublithographic to coarsely granular	23	115
Dolomite, brownish-gray, very finely crystalline, compact, grading through light gray dolomitic limestone to limestone below	15	130
Limestone, light gray, sublithographic, and limestone, argillaceous, light greenish-gray, finely to coarsely granular	25	155
Limestone, light brownish-gray, lithographic	15	170
Dolomite, brownish-gray, finely crystalline	15	185
Limestone, dolomitic, brownish-gray, granular, brecciated and oölitic; shale, silty, light blue, weak, partly in breccia; siltstone, calcareous, light gray, grading to fine-grained sandstone	15	200

[87] Log derived from samples of well cuttings studied by L. E. Workman.
[88] Elevation estimated from Alton quadrangle topographic map.

	Thickness Feet	Depth Feet
Limestone, brownish-gray, lithographic to oölitic; shale, very silty, calcareous, brown	20	220
Dolomite, brownish-gray, finely crystalline	20	240
Limestone, light brownish-gray, oölitic, fine to coarse	10	250
Limestone, light brownish-gray, oölitic or lithographic, grading through limestone, dolomitic, light brownish-gray, sublithographic to coarse-grained, to dolomite, partly argillaceous or silty, light gray at top to brown at bottom, very finely granular; shale, silty, calcareous, brown, at top; sandstone, light gray, fine-grained, at bottom	25	275
Dolomite, cherty, brownish-gray speckled with dark gray, black, or brown, very finely crystalline	50	325
Dolomite as above; limestone, dolomitic, argillaceous, sandy, cherty, speckled brown and dark gray; shale, dolomitic, dark brown, firm; sandstone, dark gray, medium rounded grains	10	335
Salem formation		
Limestone, dolomitic, argillaceous, sandy, speckled buff, brownish-gray, and dark gray, coarsely granular; glauconitic in lowermost 20 feet	65	400
Osage group		
Warsaw formation		
Shale, silty, calcareous, gray, micaceous	53	453
Keokuk and Burlington formations		
Limestone, dolomitic, very cherty, light gray speckled dark, very coarsely granular; chert is light bluish-gray, light yellowish-gray, and white; shale, silty, calcareous and dolomitic, gray, micaceous, in upper 15 feet	57	510
Dolomite, very cherty, mottled white and light buffish-gray, very finely crystalline, partly glauconitic	20	530
Limestone, cherty, light buff, coarsely granular; chert is white	15	545
Limestone, dolomitic, very cherty, light buff to light brown, coarsely granular; chert is white with dark gray spots	20	565
Dolomite, calcareous, cherty, glauconitic, buff, very finely crystalline to coarsely granular; chert is white, glauconitic	20	585
Dolomite, cherty, white and light buff, very finely crystalline, glauconitic in upper 10 feet; chert is white to light gray	65	650
Fern Glen formation		
Limestone, dolomitic, argillaceous, cherty, gray, green, and red, very finely granular with scattered coarse grains	60	710
Limestone, slightly dolomitic, argillaceous, light greenish-gray, sublithographic to very finely granular with coarse grains; shaly at top and bottom	35	745
Kinderhook group		
Hannibal and Sweetland Creek formations		
Shale	50	795
Shale, black, micaceous, tough, contains *Sporangites*; sandstone, cherty, glauconitic, pyritic, coarse-grained	5	800

	Thickness Feet	Depth Feet
Devonian system		
Senecan series		
Dolomite and limestone, sandy, buff and brown to brownish-gray, sublithographic to finely crystalline with scattered grains; some sandstone in upper half	30	830
Silurian system		
Niagaran and Alexandrian series		
Dolomite, very silty, light greenish-gray, very finely granular, compact, locally grading to siltstone, dolomitic, argillaceous, light gray	75	905
Dolomite, light gray to buff, very finely crystalline, porous	55	960
Limestone, very dolomitic, light gray and light buff with pink spots, very finely crystalline with scattered coarse grains	15	975
Dolomite, white, finely crystalline, vesicular	25	1000
Dolomite, cherty, white to light buff, finely crystalline, glauconitic	25	1025
Dolomite, buff speckled with brown, very finely crystalline	20	1045
Ordovician system		
Cincinnatian series		
Maquoketa group		
Shale, dolomitic, bluish-gray	80	1125
Dolomite, argillaceous, cherty, white to brown, very finely crystalline, and shale, dolomitic, bluish-gray with brown or black specks	40	1165
Limestone, cherty, very siliceous, gray speckled with black, very finely granular, interbedded with shale, dolomitic, bluish-gray with dark specks	35	1200

57. Gartner well,[89] SW. ¼ NE. ¼ Sec. 23, T. 5 S., R. 8 W., Madison County, Illinois

Elevation 474 feet[90]

Pleistocene system		
Soil, clay, and gravel	25	25
"Quicksand" and gravel	4	29
Blue clay (till?) and gravel	19	48
Gravel	26	74
"Quicksand" and gravel	15	89
Clay (till?), blue, and gravel	5	94
Pennsylvanian system		
Sandstone	5	99
Limestone, gray, hard	3	102
Sandstone (?)	3	105
Limestone, gray	5	110
Sandstone, straw-colored, fine-grained; limestone	5	115
Shale ("slate"), gray, fine-textured, thinly laminated	3	118
Limestone, sandy ("sandstone"), gray; sand is colorless to red	12	130
Shale ("slate"), gray	10	140
Coal	2	142

[89] Log derived from driller's log and from samples of well cuttings studied by H. M. DuBois.
[90] Elevation determined by P. S. McClure.

	Thickness Feet	Depth Feet
Shale ("slate"), gray	28	170
Shale, gray, and limestone, gray	20	190
Coal	2	192
Shale ("slate"), gray	33	225
Coal (No. 2)	5	230
"Slate" (shale)	45	275
Limestone, shaly	5	280
"Slate" (shale)	18	298
Coal	10	308
"Slate" (shale)	27	335
Mississippian system		
Chester series		
"Slate" (shale), red	3	338
Shale, hard	37	375
"Slate" (shale), red	25	400
Shale, white	40	440
Shale, red	5	445
Sandstone	3	448
"Slate" (shale)	56	504
Sandstone, calcareous, some shale	16	520
Sandstone, calcareous, colorless	25	545
Iowa series		
Meramec group		
Limestone, light gray and gray, with gray shale, white chert, and white crystalline gypsum	455	1000
Osage and Kinderhook groups		
Only one sample of light gray shale, possibly from Warsaw or Hannibal formation; other formations not represented or recorded	442	1442
Devonian and Silurian systems		
Senecan (Devonian) and Niagaran (Silurian) series		
No record	223	1665
Silurian system		
Niagaran and Alexandrian (?) series		
Limestone, gray, subcrystalline	10	1675
Limestone, bluish-gray and buff, subcrystalline, fine-grained	35	1710
Dolomite, buff, finely crystalline	68	1778
Ordovician system		
Cincinnatian series		
Maquoketa group		
Shale, calcareous, gray, fine-grained	72	1850
Shale, calcareous, gray, and limestone, gray	14	1864
Limestone, gray	16	1880
Limestone, dolomitic, bluish-gray, hard	30	1910
Mohawkian series		
Kimmswick formation		
Limestone, straw-colored, finely crystalline	61	1971
Limestone, dolomitic, gray to grayish-white	34	2005
Decorah formation		
Sandstone (?), white, very fine-grained, grains colorless; driller noted "gas"	25	2030
Plattin formation		
Limestone, light straw-colored, crystalline, contains blue shale at 2100-2130 feet	165	2195

58. Madison Coal Corporation coal-test No. 6,[91] center of SW. ¼ SE. ¼ SW. ¼ Sec. 26, T. 4 N., R. 8 W., Madison County, Illinois

Elevation 502.6 feet

	Thickness		Depth	
	Feet	Inches	Feet	Inches
Recent and Pleistocene systems				
Clay, sandy, light yellow to gray	45	0	45	0
Clay, sandy, pebbly, light-colored	20	0	65	0
Pennsylvanian system				
Shale, light gray, soft	5	0	70	0
Shale, calcareous, light gray, soft, micaceous	12	0	82	0
Shale, calcareous, light gray, very fine-grained, compact	5	6	87	6
Shale, calcareous, sandy, light greenish-gray, hard	3	8	91	2
Limestone, cherty, light brown, hard, compact	11	10	103	0
Limestone, brown mottled with green, hard, compact	5	10	108	10
Shale, light to dark brown, soft	14	0	122	10
Shale, calcareous, gray with yellow and irregular bands ranging to light green, hard, nodular	5	6	128	4
Limestone, shaly, dark gray in irregular bands, hard	6	6	134	10
Shale, calcareous, sandy, mottled greenish-gray and brown, fine-grained, micaceous, soft, irregularly banded	2	11	137	9
Shale, bituminous, dark black		3	138	0
Coal (No. 6), bituminous; shale band ½ inch thick 18 inches from bottom	7	6	145	6
Underclay, dark gray, plastic		6	146	0
Shale, dark gray, irregularly laminated, with calcareous grains	1	2	147	2
Limestone, shaly, light gray, fine-grained, micaceous, hard, irregularly laminated	3	1	150	3
Shale, calcareous, green and brown, hard	1	9	152	0
Shale, calcareous, dark gray to black, soft	3	4	155	4
Shale, calcareous, mottled greenish-gray and brown, hard, irregularly nodular and wavy	7	8	163	0
Limestone, bluish-gray, fine-grained, hard, compact, pyritic	2	6	165	6
Shale, calcareous, light gray, soft	2	6	168	0
Shale, calcareous, with sandy streaks, light bluish-gray, hard, compact	12	0	180	0
Shale, calcareous, light gray, soft	11	3	191	3
Shale, dark gray, hard, evenly bedded; occasional thin sand parting	32	3	223	6
Coal	1	9	225	3
Sandstone, gray, fine-grained to medium-grained grading down to and interbedded with shale, dark gray, fine-grained	17	11	243	2
Shale, black, fine-grained, hard, evenly laminated		8	243	10

[91] Log derived from study of drill core.

	Thickness		Depth	
	Feet	Inches	Feet	Inches
Shale, light gray, hard, evenly laminated	13	8	257	6
Shale, calcareous, dark gray, hard, fossiliferous		8	258	2
Limestone, shaly, mottled dark and light gray, hard, fossiliferous	1	0	259	2
Shale, very dark gray to black, fine-grained, hard, evenly laminated	3	4	262	6
Coal	2	6	265	0
Shale, light to dark gray	8	3	273	3
Limestone, bluish-gray, hard, compact, with breccia of light brown limestone		11	274	2
Shale, light gray, soft	3	10	278	0
Shale, sandy, calcareous, gray, fine-grained, hard; occasional large irregular spots of dark red and brown shale	10	6	288	6
Mississippian system				
Chester series				
Shale, purple and yellowish-brown, soft	4	11	293	5
Shale, light greenish-gray, soft	1	4	294	9
Limestone, gray, hard, crystalline, with partings of dark gray shale		9	295	6
Shale, yellow, soft	8	0	303	6
Limestone, gray, coarsely crystalline, hard, fossiliferous, with bands of green shale	8	1	311	7
Shale, calcareous, dark greenish-gray, soft, with bands of limestone, white, crystalline, fossiliferous	3	5	315	0
Limestone, light gray, crystalline, hard, fossiliferous, with streaks of dark bluish-gray shale	18	1	333	1
Shale, generally calcareous, locally sandy, dark gray, fine-grained, hard, with bands of fossiliferous hard, dark gray limestone	18	11	352	0
Shale, sandy, red, green, and gray, with streaks of sandstone	22	0	374	0
Shale, dark gray, soft	12	0	386	0
Sandstone, light gray, fine-grained, soft, with streaks of gray shale	17	0	403	0
Limestone, light yellowish-gray, crystalline, hard, fossiliferous, with bands and partings of soft greenish-gray, calcareous shale	14	9	417	9
Shale, dark, red, grayish-green, hard, with bands of hard, light-colored limestone	17	5	435	2
Limestone, siliceous, fine-grained, very hard	7	10	443	0
Shale, dark greenish-gray, soft	9	0	452	0
Limestone, light pinkish-gray, coarsely crystalline, hard, fossiliferous, in beds 1-2 feet thick with intervening beds of hard gray shale 3-6 inches thick	8	8	460	8
Sandstone, medium-grained, soft, with seams of bluish-gray shale	27	10	488	6

	Thickness		Depth	
	Feet	Inches	Feet	Inches
Shale, sandy, light to dark gray, fine-grained, soft	20	11	509	5
Shale, clayey, red and gray, soft	3	2	512	7
Shale, sandy, dark gray, soft	8	5	521	0
Sandstone, light gray, medium-grained	18	0	539	0
Shale, sandy, light bluish-gray, hard	7	2	546	2
Sandstone, light gray, medium-grained, pyritic at base	10	8	556	10
Iowa series				
Meramec group				
Ste. Genevieve formation				
Limestone, light gray, fine-grained, crystalline, very hard, fossiliferous, with cherty streaks and shale partings	153	2	710	0
St. Louis formation				
Limestone, very gypsiferous, gray to brown, fine-grained	147	0	857	0
Limestone, shaly, sandy, light gray with brown, blue and green tinting, fine-grained to coarsely crystalline	107	6	964	6
Shale, sandy, calcareous, gray, hard	9	6	974	0
Salem formation				
Limestone, gray, very coarsely crystalline, with shaly streaks and white chert	72	0	1046	0
Osage group				
Warsaw formation				
Shale, calcareous, dark gray, hard	59	6	1105	6
Keokuk and Burlington formations				
Limestone, light gray, crystalline	43	6	1149	0
Limestone, cherty, light yellowish-gray, fine-grained	55	0	1204	0
Fern Glen formation				
Limestone, siliceous, white to yellowish-gray, fine-grained, hard, with shale streaks	70	0	1274	0
Limestone, shaly, siliceous, variegated white, gray, green, and yellow, fine-grained	107	6	1381	6
Shale, calcareous, red and green, fossiliferous	14	6	1396	0
Limestone, shaly, red, yellow, green, and gray, fine-grained	10	6	1406	6
Kinderhook group				
Hannibal formation				
Shale, sandy at top and bottom, greenish-gray to gray, soft	27	2	1433	8
Sweetland Creek formation				
Shale, black, laminated	21	6	1455	2
Silurian system				
Niagaran series				
Limestone, siliceous, light gray, porous, chalky	54	10	1510	0
Limestone, shaly, gray, fine-grained	32	0	1542	0
Limestone, shaly, variegated gray, yellow, and red, fine-grained	131	9	1673	9
Alexandrian series				
Limestone, light gray, crystalline	114	3	1788	0

	Thickness Feet	Inches	Depth Feet	Inches
Ordovician system				
Cincinnatian series				
Maquoketa group				
Shale, grading down from greenish-gray to dark gray	98	6	1886	6
Limestone, interbedded with calcareous shale, gray and dark gray	55	6	1942	0
Mohawkian series				
Kimmswick formation				
Limestone, cherty, light pinkish-gray	15	0	1957	0
Limestone, siliceous, light brownish-gray, fine-grained, hard	57	0	2014	0
Decorah formation				
Limestone, light gray, crystalline, hard, with many streaks of dark gray, calcareous shale	60	0	2074	0
Plattin formation				
Limestone, siliceous, yellowish-gray, fine-grained	86	0	2160	0
Limestone, "flinty" (?), gray, finely crystalline	71	0	2231	0
Limestone, light gray, lithographic, with shale partings	18	0	2249	0
Limestone, siliceous, gray, hard	34	0	2283	0
Limestone, siliceous, light gray to brown, fine-grained, hard, with dark shale partings	143	0	2426	0
Joachim formation				
Limestone, light yellowish-gray, soft	51	0	2477	0
Shale, sandy, gray, soft	10	0	2487	0
Limestone, brown, soft	9	0	2496	0
Chazyan series				
St. Peter formation				
Sandstone, yellowish-gray	4	0	2500	0

59. Ohio Oil Company test well,[92] Peter Stifel No. 1, center of W. ⅓ NW. ¼ SE. ¼ Sec. 14, T. 3 N., R. 8 W., Madison County, Illinois

Elevation 562 feet[93]

	Thickness Feet	Depth Feet
Pleistocene system		
Clay	20	20
Gravel	3	23
Pennsylvanian system		
Shale	56	79
Limestone	17	96
Shale	74	170
Limestone	10	180
Shale	5	185
Limestone	5	190
Coal	4	194
Limestone	15	209
Coal	8	217
Limestone	4	221
Shale	97	318
Limestone	4	322
Shale	18	340

[92] Driller's log.
[93] Elevation estimated from Belleville quadrangle topographic map.

	Thickness Feet	Depth Feet
Mississippian system		
Chester series		
Shale, yellow	20	360
Limestone	35	395
Shale	10	405
Sandstone, with salt water	50	455
Shale, red	11	466
Shale, gray	14	480
Limestone	9	489
Shale, gray	16	505
Shale, red	20	525
Sandstone	29	554
Shale	31	585
Limestone (siltstone?)	31	616
Shale	12	628
Sandstone	9	637
Iowa series		
Meramec group		
Ste. Genevieve and St. Louis formations		
Limestone	393	1030
St. Louis formation		
Sandstone, with salt water	85	1115
Salem formation		
Limestone, "broken" (shaly)	65	1180
Iowa series		
Osage group		
Warsaw formation		
Shale	50	1230
Keokuk and Burlington formations		
Limestone	20	1250
"Sandstone" (cherty limestone) with salt water	20	1270
Limestone	65	1335
Fern Glen formation		
"Sand rock" (siliceous limestone)	25	1360
Limestone	60	1420
"Sand rock" (siliceous limestone)	10	1430
Limestone	35	1465
Shale	10	1475
Limestone	11	1486
Shale	23	1509
Limestone	16	1525
Kinderhook group		
Hannibal and Sweetland Creek formations		
Shale	42	1567
Silurian system		
Niagaran series		
Limestone	48	1615
Shale	15	1630
Limestone	77	1707
Shale, red	8	1715
Shale, gray	17	1732
Shale, red	28	1760
Alexandrian series		
Limestone, with water	100	1860
Ordovician system		
Cincinnatian series		
Maquoketa group		
Shale	115	1975
Limestone	37	2012
Mohawkian series		
Kimmswick formation		
Limestone, yellow, white, and gray	90	2102

	Thickness Feet	Depth Feet
Decorah formation		
Limestone, "broken" (shaly)	15	2117
Limestone, brown	13	2130
Limestone, "broken" (shaly)	7	2137
Limestone, brown	8	2145
Limestone, gray	10	2155
Limestone, "broken" (shaly)	5	2160
Plattin formation		
Limestone, yellow	24	2184

60. Madison Oil and Gas Company test well,[94] Ferdinand Keller No. 3, NW. corner SW. ¼ NW. ¼ Sec. 8, T. 3 N., R. 8 W., Madison County, Illinois

Elevation 418 feet[95]

Pleistocene system		
Drift	135	135
Mississippian system		
Chester series		
"Slate" (shale)	10	145
Limestone	25	170
"Slate" (shale), gray	15	185
"Rock" (shale, calcareous), red	15	200
Shale, hard	40	240
"Rock," (shale, calcareous), red	20	260
"Slate" (shale)	100	360
Sandstone	60	420
Iowa series		
Meramec group		
Ste. Genevieve and St. Louis formations		
Limestone	380	800
St. Louis formation		
Sandstone	30	830
Salem formation (may include some Warsaw formation at base)		
Limestone	70	900
Osage group		
Warsaw formation		
Shale, hard	40	940
Keokuk, Burlington, and Fern Glen formations		
"Water sand" (cherty limestone)	60	1000
Limestone	160	1160
Fern Glen formation		
Shale, hard	15	1175
"Slate" (shale, calcareous)	[a]40	1215
Limestone	25	1240
Kinderhook group		
Hannibal and Sweetland Creek formation		
"Slate" (shale)	[a]30	1270
Devonian system		
Senecan series		
Sandstone	20	1290
Silurian system		
Niagaran and Alexandrian series		
Limestone	30	1320

[94] Driller's log.

[95] Elevation estimated from Monks Mound quadrangle topographic map.

[a] Original log records 10 and 60 feet of shale respectively at upper and lower horizons, but these figures are changed to agree with those from two other wells on the Keller property and from other wells in the region.

	Thickness Feet	Depth Feet
Limestone, brown	45	1365
Limestone, gray	135	1500
"Water sand" (basal Silurian)	15	1515

61. Valley Oil Company test-well,[96] Look No. 1, NW. ¼ NW. ¼ Sec. 1, T. 3 N., R. 9 W., Madison County, Illinois

Elevation 423 feet[97]

Pleistocene system		
Soil, dark brown	4	4
Sand, fine-grained, red and yellow, micaceous	108	112
Mississippian system		
Chester series		
Limestone, light tan or bluish-gray, dense	33	145
Soil, dark brown	4	4
Sand, fine-grained, red and yellow, micaceous	108	112
Shale, red and greenish-gray, medium hard	63	208
Limestone, argillaceous, tan, pyritic	3	211
Shale, red and greenish-gray, medium hard	118	329
Limestone, sandy, white and light tan	46	375
Iowa series		
Meramec group		
Ste. Genevieve formation		
Dolomite, light brownish-gray, cherty, very fine-grained	85	460
St. Louis formation		
Limestone, dolomitic, argillaceous, grayish-brown, very fine- to coarse-grained, with bituminous specks	78	538
Dolomite and limestone, brownish-gray, fine- to coarse-grained	7	545
Limestone, light gray, sublithographic, gypsiferous	15	560
Limestone, grayish-brown, oölitic, medium-grained	40	600
Limestone, partly dolomitic, brownish-gray, lithographic, gypsiferous	45	645
Limestone, brownish-gray, finely granular, very cherty in upper part, chert speckled black and white	95	740
Salem formation		
Limestone, speckled light buff and dark gray, coarsely granular	60	800
Osage group		
Warsaw formation		
Limestone, marly, bluish	79	879
Keokuk and Burlington formations		
Limestone, white to light buff, dense, crystalline, some chert at bottom	179	1058
Fern Glen formation		
Shale, very dolomitic and calcareous, greenish-gray, hard	14	1072
Limestone, marly, light bluish to tan	59	1131
Shale, red and green, soft	4	1135
Limestone, light buff to gray, dense	2	1137
Shale, calcareous, greenish-gray, soft	3	1140

[96] Log derived from samples of well cuttings cursorily examined by C. R. Clark and L. E. Workman.

[97] Elevation estimated from Monks Mound quadrangle topographic map.

	Thickness Feet	Depth Feet
Shale, red, soft	18	1158
Limestone, light greenish-gray with pink spots	34	1192
Kinderhook group		
Hannibal formation		
Shale, gray to brownish-gray	18	1210
Shale, black, pyritic, tough	2	1212
Louisiana (?) formation		
Limestone, light gray, lithographic	4	1216
Sweetland Creek formation		
Shale, dark to black, with *Sporangites;* sandstone, fine- to medium-grained with pyritic cement.	17	1233
Devonian system		
Senecan series		
Limestone, sandy, brown	5	1238
Silurian system		
Niagaran series		
Limestone, dolomitic, light gray with greenish tint, very fine-grained	40	1278
Siltstone, grayish-green, compact, micaceous, and shale, dolomitic, silty, slightly micaceous, red and greenish-gray, with limestone, marly gray, predominant in lower half	94	1372
Alexandrian series		
Limestone, light buff, pink, and white	106	1478
Ordovician system		
Cincinnatian series		
Maquoketa group		
Shale, dark greenish-gray, hard and brittle	132	1610
Marl, bluish-gray	20	1630
Mohawkian series		
Kimmswick formation		
Limestone, white to light buff, dense, finely crystalline	93	1723
Decorah formation		
Limestone, marly, dark tan to gray	24	1747
Plattin formation		
Limestone, buff, dense, finely crystalline	193	1940
Chazyan series		
Joachim formation		
Shale, calcareous, dark greenish-gray, hard, laminated	7	1947
Limestone, buff, dense, finely crystalline	13	1960
Limestone, marly, bluish-gray to buff	40	2000
Limestone, dolomitic, dark tan	17	2017
Limestone, marly, silty, tan and bluish	3	2020

62. George W. Niedringhaus test-well,[98] D. J. Sullivan No. 1, center NW. ¼ SE. ¼ Sec. 22, T. 3 N., R. 9 W., Madison County, Illinois

Elevation 410± feet[99]

Pleistocene system		
Sand and gravel	117	117
Mississippian system		
Chester series		
Limestone, hard	3	120
Shale, dark, soft	50	170
Shale, pink	10	180

[98] Log derived mainly from samples of well cuttings studied by A. W. Thurston supplemented by driller's log and by samples from well No. 2 studied by George E. Ekblaw.

[99] Elevation estimated from Monks Mound quadrangle topographic map.

	Thickness Feet	Depth Feet
Shale, blue	35	215
Shale, pink	10	225
Limestone, gray	10	235
Shale, blue	15	250
Iowa series		
Meramec group		
Ste. Genevieve formation (may be Chester series)		
Limestone, gray, hard	25	275
Shale, blue	5	280
Ste. Genevieve and St. Louis formations		
Limestone, gray, very hard	135	415
St. Louis formation		
Limestone, drab, lithographic, hard	20	435
Limestone, mottled gray and brownish-drab, coarsely crystalline	20	455
Limestone; sandstone, medium- to fine-grained, subangular grains, poorly sorted; shale, sandy, brown; shale, green and red	15	470
Limestone, dolomitic, argillaceous, brownish-gray, finely crystalline, fossiliferous, sandy in lower part	120	590
Limestone, dolomitic, gray, cherty, and sandstone, calcareous, gray, fine-grained, grains angular	10	600
Salem formation		
Limestone, dolomitic, mottled buff and gray, medium to coarsely crystalline	60	660
Osage group		
Warsaw formation		
Limestone, argillaceous, shaly, sandy, dark gray, fine-grained	10	670
Shale, silty, calcareous, bluish-gray	20	690
Limestone, argillaceous, gray, subcrystalline, with chalcedonic chert (geodes), and shale as above	30	720
Siltstone, calcareous, dark	5	725
Keokuk and Burlington formations		
Limestone, gray	35	760
Limestone, cherty, light bluish-gray to white, finely crystalline	165	925
Fern Glen formation		
Limestone, light to dark drab, dense, cherty	50	975
Shale, light gray	15	990
Limestone, shaly, sandy, light greenish-gray, dense, cherty	5	995
Shale, calcareous, greenish-gray, soft	35	1030
Shale, calcareous, red and green	15	1045
Limestone, shaly, pinkish-gray and greenish-gray	30	1075
Kinderhook group		
Hannibal formation		
Shale, green	25	1100
Sweetland Creek (?) formation		
Shale, calcareous, dark, hard	6	1106
Devonian system		
Senecan series		
Sandstone, calcareous, brownish-gray, coarse-grained	4	1110
Silurian system		
Niagaran series		
Siltstone, calcareous, light greenish-gray	2	1112
Limestone, argillaceous, light drab	23	1135
Limestone, shaly, red and greenish-gray	90	1225

	Thickness Feet	Depth Feet
Alexandrian series		
Limestone, pinkish-gray, fine-grained	47	1272
Limestone, bluish-gray	18	1290

63. Commonwealth Steel Company test-well,[1] NW. ¼ SW. ¼ Sec 24, T. 3 N., R. 10 W., Madison County, Illinois

Elevation 423 feet[2]

Pleistocene system	117	117
Alluvium		
Mississippian system		
Iowa series		
Meramec group		
Ste. Genevieve formation (may be Chester series)		
Limestone, brown, hard	39	156
Shale	8	164
St. Louis formation		
Limestone, grayish-white, subcrystalline	49	213
Limestone, dolomitic, brownish-gray	155	368
Limestone, dolomitic, sandy, brownish-gray	47	415
Salem formation		
Limestone, shaly, gray and brownish-gray, hard	48	463
Limestone, shaly, sandy, gray, soft	7	470
Osage group		
Warsaw formation		
Shale, sandy, slightly calcareous	21	491
Shale	57	548
Keokuk and Burlington formations		
Limestone, gray, very hard	50	598
Limestone, very cherty, light gray	114	712
Fern Glen formation		
Limestone, greenish-gray and pink, and shale, in streaks	71	783
Shale, purple, red, and green	37	820
Limestone, buffish-gray and green	23	843
Kinderhook group		
Hannibal formation		
Shale, dark	30	873
Silurian system		
Niagaran series		
Limestone, brownish-gray, crystalline, and limestone, shaly, light greenish-gray	47	920
Alexandrian series		
Limestone, pink, brown, and white	55	975
Limestone, tan-gray, crystalline	43	1018
Ordovician system		
Cincinnatian series		
Maquoketa group		
Shale, slightly calcareous, grayish-green	165	1183
Mohawkian series		
Kimmswick formation		
Limestone, light brownish-gray, crystalline	82	1265
Decorah formation		
Limestone, argillaceous, shaly, dark gray, finely crystalline, compact, sandy at bottom	50	1315
Plattin formation		
Limestone, light brownish-gray, crystalline, granular	154	1469

[1] Log derived from samples of well cuttings studied by A. W. Thurston supplemented by driller's log.

[2] Elevation estimated from Granite City quadrangle topographic map.

	Thickness Feet	Depth Feet
Limestone, dark gray, compact, with green and black shale and sandy streaks	31	1500
Limestone, tan, finely crystalline	21	1521
Chazyan series		
Joachim formation		
Limestone, light and dark gray, with greenish-gray shale	30	1551
Sandstone, fine-grained	1	1552
Limestone, sandy, dirty brownish-gray, with grayish-green shale	27	1579
Limestone, sandy, light tan to dark gray, with dark shale, sand more abundant at base	47	1626
St. Peter formation		
Sandstone, white, soft	131	1757
Prairie du Chien series		
Beekmantown group		
Powell, Cotter, and Jefferson City formations		
Limestone, dolomitic, more or less sandy, white to brown, with limestone, argillaceous, greenish-gray, grading to shale, calcereous, green	328	2085

64. Socrates J. Schantz well,[3] W. part of lot 5, United States Survey 114 (center, SE. ¼ Sec. 35), T. 47 N., R. 7 E., St. Louis County, Missouri
Elevation 440 feet[4]

Pleistocene system		
Soil, gravel, and talus with blocks of coal and shale	58	58
Mississippian system		
Chester (?) series		
Limestone, sandy, white to bluish-gray and greenish-gray, oölitic; sandstone, more or less calcareous, gray; silt-stone, greenish	40	98
Conglomerate, calcareous, mainly chert	16	114
Iowa series		
Meramec group		
Ste. Genevieve formation		
Limestone, more or less dolomitic, more or less sandy, white to olive-gray, locally cherty, locally oölitic, finely to medium crystalline	58	172
St. Louis formation		
Limestone, dolomitic, light brownish-drab to dark olive drab, finely crystalline, locally sandy and silty	28	200
Limestone, dolomitic, gray, lithographic	35	235
Sandstone, calcareous, dark bluish-gray to greenish-gray, fine to coarse-grained	15	250
Limestone, siliceous, silty, sandy, dark bluish-gray, brownish in lower 55 feet, dense to finely crystalline, locally cherty	170	420
Salem formation		
Limestone, dolomitic, oölitic, mottled dark bluish-gray and tan-drab	60	480
Osage group		
Warsaw formation		
Siltstone, calcareous, very dark bluish-gray to light gray	40	520
Shale, light greenish-gray	55	575
Keokuk and Burlington formations		
Limestone, gray, white, and tan, very cherty	250	825

[3] Log derived from samples of well cuttings studied by George E. Ekblaw.
[4] Elevation estimated from Alton quadrangle topographic map.

	Thickness Feet	Depth Feet
Fern Glen formation		
Limestone, silty, greenish-gray	40	865
Limestone, silty, purple, red and green	45	910
Kinderhook group		
Hannibal formation		
Shale, light greenish-gray	45	955
Devonian system		
Senecan series		
Sandstone, calcareous, fine-grained	10	965
Silurian system		
Niagaran series		
Limestone, dolomitic, silty, greenish-gray, bluish-gray, tan-gray, white, and pink, finely crystalline	50	1015
Alexandrian series		
Limestone, dolomitic, cherty, bluish-white to dark tan, crystalline	75	1090
Ordovician system		
Cincinnatian series		
Maquoketa group		
Shale, dark green	115	1205
Mohawkian series		
Kimmswick formation		
Limestone, dolomitic, sandy, light gray	95	1300

65. John Furstenberg farm well,[5] ¼ mile NE. of Carsonville (SW. ¼ NW. ¼ Sec. 23), T. 46 N., R. 6 E., St. Louis County, Missouri

Elevation 600± feet[6]

No record	300	300
Mississippian system		
Iowa series		
Meramec group		
St. Louis formation		
Limestone, light bluish-gray, brecciated, locally shaly, cherty at bottom	60	360
Limestone, drab, lithographic	35	395
Limestone, sandy, silty	125	520
Salem formation		
Siltstone, calcareous, dark gray, speckled	80	600
Osage group		
Warsaw formation		
No record (shale)	50	650
Keokuk and Burlington formations		
Limestone, light gray, cherty	250	900
Fern Glen formation		
Chert, purplish-red and white, with gray limestone	10	910
No record	15	925
Limestone, purplish, crinoidal	25	950
Limestone, dolomitic, drab, dense, with some silt and shale (may be Chouteau formation of Kinderhook group)	40	990
Kinderhook group		
Hannibal and Sweetland Creek formations		
Shale, light drab, nonlaminated; shale, black, laminated; sandstone, quartz grains, rounded, with pyritic cement	10	1000

[5] Log derived from samples of well cuttings studied by George E. Ekblaw.
[6] Elevation estimated from St. Louis quadrangle topographic map.

	Thickness Feet	Depth Feet
Silurian system		
Alexandrian series		
Edgewood formation		
Dolomite, calcareous, buff, crystalline, with much bluish-white chert	40	1040
Ordovician system		
Cincinnatian series		
Maquoketa group		
Siltstone, fine-grained, and shale, greenish-gray, dark at base	140	1180
Mohawkian series		
Kimmswick formation		
Limestone, light tan-gray, cherty	90	1270
Decorah formation		
Limestone, sandy, dark buff becoming lighter below, with siltstone, dark olive, fine-grained	52	1322
Plattin formation		
Limestone, light to dark drab, buff to tan at top, cherty	198	1520
Chazyan series		
Joachim formation		
Limestone, bluish-gray, and siltstone, greenish	65	1585
Limestone, sandy, purplish-drab to tan	25	1610
St. Peter formation		
Sandstone, white, fine- to coarse-grained	120	1730
Prairie du Chien series		
Powell, Cotter, and Jefferson City formations		
Dolomite, calcareous, more or less sandy, bluish-gray, locally cherty, locally with greenish siltstone	501	2231
Roubidoux formation		
Sandstone, dolomitic, fine- to coarse-grained	121	2352
Gasconade and Van Buren formations		
Dolomite, calcareous, sandy, light gray	193	2545
Sandstone, dolomitic (Gunter member)	20	2565
Cambrian system		
Eminence formation		
Dolomite, buff to light tan-gray	203	2768
Potosi formation		
Dolomite, sandy, dirty gray	272	3040
(Crevice reported)	30	3070

66. St. Louis Insane Asylum well,[7] (center of SW. ¼ Sec. 30, T. 45 N., R. 7 E.),[8] St. Louis County, Missouri

Elevation 590± feet[8]

	Thickness Feet	Thickness Inches	Depth Feet	Depth Inches
Pleistocene system				
Clay	40		40	
Pennsylvanian system				
Limestone, "tumbled"	4		44	
Clay, red	5		49	
Limestone	8		57	
Clay, red	4		61	
Coal	5		66	
Underclay	2		68	
Limestone, light colored	5	9	73	9
"Fireclay," slightly calcareous, blue and drab	6	3	80	

[7] Compiled from driller's log and log of samples studied by G. C. Broadhead.
[8] Location uncertain; elevation estimated from St. Louis quadrangle topographic map.

	Thickness Feet	Thickness Inches	Depth Feet	Depth Inches
Limestone, cherty	6		86	
Shale, slightly calcareous, dark and bluish-gray	21		107	
Limestone, cherty	4		111	
Coal	1		112	
Underclay, light blue	8		120	
Mississippian system				
Iowa series				
Meramec group				
St. Louis formation				
Limestone, cherty	9		129	
Limestone, bluish-white	34	4	163	4
Limestone, cherty, gray	22	8	186	
Limestone, cherty, bluish, coarse-grained	76		262	
Shale, blue	3		265	
Limestone, cherty, drab, hard	97		362	
Salem formation				
Limestone, grayish and light drab	38		400	
Limestone, dark colored	38		438	
Osage group				
Warsaw formation				
Shale, blue	2	4	440	4
Shale, with white limestone	95	8	536	
Keokuk and Burlington formations				
Limestone, cherty, blue, very hard	102		638	
Limestone, cherty, bluish-gray, coarse-grained	65		703	
"Sandstone" (limestone?)	6		709	
Limestone, cherty	42		751	
Fern Glen formation				
Limestone, "muddy," blue	17		768	
Limestone, light gray and drab, and shale with geodes	22		790	
Limestone, red	10		800	
Limestone, light drab and bluish gray	33	7	833	7
Kinderhook group				
Sweetland Creek formation				
"Mud" (shale), dark brown to black	7	5	841	
Silurian system				
Alexandrian series				
Limestone, light gray to yellow	42		883	
Ordovician system				
Cincinnatian series				
Maquoketa group				
Shale, blue	67		950	
Shale, very sandy, brown	16	8	966	8
Shale, blue	55	4	1022	
Limestone, light, "ashy," gray	18		1040	
Mohawkian series				
Kimmswick formation				
Limestone, yellowish-white	83		1123	
Decorah formation				
Limestone, white	30		1153	
Limestone, yellowish-white	10		1163	
Plattin formation				
Limestone, sandy, white	26		1189	
Limestone, cherty, bluish-white	135		1324	
Limestone, cherty, drab	29		1353	

	Thickness		Depth	
	Feet	Inches	Feet	Inches
Chazyan series				
Joachim formation				
Limestone, sand, blue	49		1402	
Limestone, blue to ash-colored	50		1452	
St. Peter formation				
Sandstone, white	108		1560	
Shale, gray, hard	2		1562	
Sandstone, "muddy," blue	10		1572	
Sandstone, white	5		1577	
Sandstone, "muddy," light blue, very hard	2		1579	
Sandstone	6		1585	
Prairie du Chien series				
Powell, Cotter, and Jefferson City formations				
Limestone, "flinty," hard	35		1620	
Limestone, cherty and sandy	482	4	2102	4
Roubidoux formation				
Limestone, sandy, hard	21	8	2124	
"Limestone," blue, hard, turns to red sandstone	12		2136	
Sandstone	48		2184	
Gasconade and Van Buren formations				
Limestone, light blue, hard, gradually gets softer	34		2218	
Limestone, cherty, blue	21		2239	
"Sandstone" (dolomite?), cherty	25		2264	
Limestone	24		2288	
Limestone, cherty and sandy	36		2324	
Limestone, very light blue	30		2354	
Limestone, cherty and sandy	9		2363	
Limestone, very sandy	7		2370	
"Flint," hard	4		2374	
Chert	12		2386	
Limestone	5		2391	
(Gunter member)				
Limestone, sandy	11		2402	
"Cherty" (sandstone?)	10		2412	
Cambrian system				
Eminence formation				
Limestone, blue and white	65		2477	
Chert	45		2522	
Limestone, blue, soft	4		2526	
Limestone, cherty, very hard	18		2544	
Limestone, white and yellowish	14		2558	
Limestone, softer	46		2604	
Potosi formation				
Limestone, cherty, hard	57		2661	
Limestone, gritty, hard, whitish	72		2733	
Limestone, cherty and sandy, hard	4		2737	
Limestone, sandy, softer	28		2765	
Limestone, flinty, hard	4		2769	
Limestone, sandy, hard	74		2843	
"Sand," concretionary, hard	37		2880	
Doerun and Derby formations				
Limestone, dark blue, turning to gray and yellow	52		2932	
Limestone, white, soft	90		3022	
Davis formation				
Limestone, sandy, blue, soft	20		3042	
Sandstone, blue	6		3048	
Sandstone, "muddy," blue	6		3054	

	Thickness Feet	Inches	Depth Feet	Inches
Limestone, sandy	51		3105	
Sandstone, very hard	15		3120	
Bonneterre formation				
"Rock, slaty," (shaly limestone)	13		3133	
Limestone, blue, turns yellow	9		3142	
Limestone, sandy	3		3145	
Limestone, bluish-gray, turns yellow	38		3183	
Limestone, sandy, dirty drab	81		3264	
Limestone, hard	80		3344	
Limestone, "muddy"	20		3364	
Limestone, very hard	14		3378	
Limestone, sandy	126		3504	
LaMotte formation				
Sandstone, dark blue, gray to white	64		3568	
Sandstone, red and blue	68		3636	
Sandstone, "muddy," dark blue turning gray and red	56		3692	
"Slate," gray	7		3699	
"Slate," and sandstone, red	17		3716	
Sandstone, red	127		3843	

STRUCTURE MAP

OF

PARTS OF

GREENE, JERSEY, AND MADISON COUNTIES

ILLINOIS

BY D. M. COLLINGWOOD

AND OTHER MEMBERS OF THE SURVEY STAFF

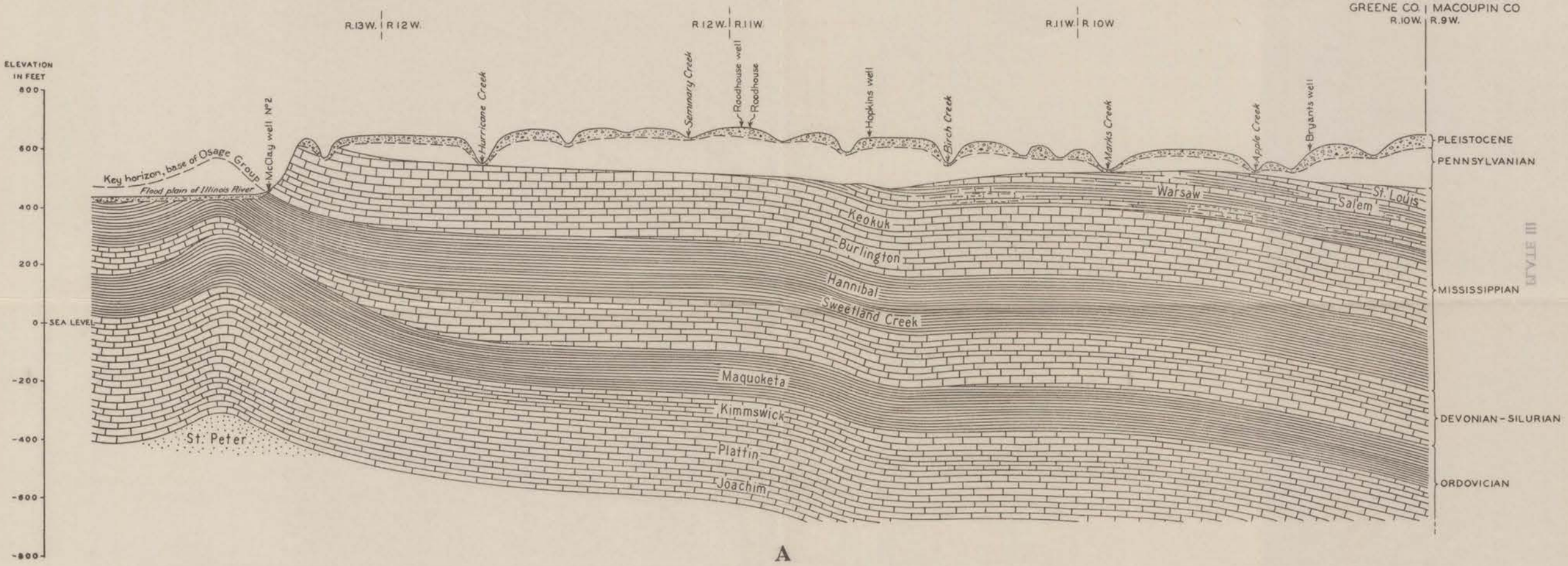
0 1 2 3 4 MILES

SCALE

LEGEND

- PENNSYLVANIAN BOUNDARY
- CONTOUR ON BASE OF OSAGE GROUP
- BLUFF LINE
- o WELL
- • OUTCROP
- 25 INDEX TO TABLE OF DATUM POINTS

ILLINOIS STATE GEOLOGICAL SURVEY



DIAGRAMMATIC SECTIONS OF STRATA FROM WEST TO EAST ACROSS (A) CENTER OF TWP. 12N., AND (B) CENTER OF TWP. 7N.

TABLE 3.—*Geologic history of the Jersey-Greene area*

(The sequence of events is given by beginning at the bottom of the table and reading upwards.)

Era	Period	Epoch	Stage	Kind of rock	Direction from which sea advanced	Geologic Events
Cenozoic		Recent		Alluvium		Weathering, erosion, and alluviation.
	Pleistocene Tertiary			Drift, till, loess Gravel and clay		Continental glaciation. Area probably above sea-level; mainly erosion.
Mesozoic				None in Jersey-Greene area		
			Unconformity			Elevation; slight tilting in direction north of east.
	Pennsylvanian			None remaining in Jersey-Greene area; shale, sandstone, East limestone, and coal in all directions		Many cycles of elevation and submergence; alternation of marine and terrestial sedimentation.
			Unconformity			Eastward tilting; slight folding and long erosion interval.
		Chester		None in Jersey-Greene area		Marine sedimentation east of Jersey-Greene area.
			Unconformity			Regional tilting and beveling of eastward dipping strata.
Paleozoic	Mississippian	Iowa — Meramec	Ste. Genevieve St. Louis	Limestone	Southeast	Marine sedimentation.
			Unconformity			Partial withdrawal of sea toward southeast.
		Iowa — Osage	Salem Warsaw Keokuk Burlington Fern Glen	Limestone	Southeast and South	Marine sedimentation; oscillatory conditions during Warsaw and Salem stages.
			Unconformity			Erosion and regional tilting to east.
		Iowa — Kinderhook	Chouteau Hannibal *Possible unconformity* Louisiana Sweetland Creek	Limestone Shale Limestone Shale	West Northwest ? Northeast	Marine sedimentation. Marine sedimentation. Down-warping to south along east-west axis. Marine sedimentation. Marine sedimentation.
			Unconformity			Erosion.
	Devonian	Senecan	Cedar Valley	Limestone	Northwest	Marine sedimentation, deposits irregular, thickest in erosional depressions.
			Unconformity			Tilting to northwest; erosion of higher land masses on Ozark flanks, including Jersey-Greene area, which continued as land through early Devonian times.
	Silurian	Niagaran		Dolomite	Northeast	Marine sedimentation; oscillatory movements in Jersey-Greene area.
			Unconformity			Emergence; erosion.
		Alexandrian	Sexton Creek	Limestone	Southeast	Marine sedimentation; regional depression to northeast.
			Edgewood	Limestone	Southeast	Marine sedimentation; tilting to southeast; local downwarping to south.
			Unconformity			Emergence; tilting toward north resulting in greater erosion of southern part.
		Cincinnatian	Maquoketa	Shale		Marine sedimentation; local downwarping to south.
	Ordovician	Mohawkian	Kimmswick Plattin	Limestone	Southeast	Marine sedimentation.
		Chazyan	Joachim St. Peter	Sandstone		Marine sedimentation.