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STRUCTURE OF HERRIN (NO. 6) COAL BED IN
MADISON COUNTY AND WESTERN BOND, WESTERN CLINTON
SOUTHERN MACOUPIN, SOUTHWESTERN MONTGOMERY
NORTHERN ST. CLAIR, AND NORTHWESTERN WASHINGTON COUNTIES, ILLINOIS


By

J. Norman Payne

With notes on the
OIL AND GAS POSSIBILITIES

By

Alfred H. Bell



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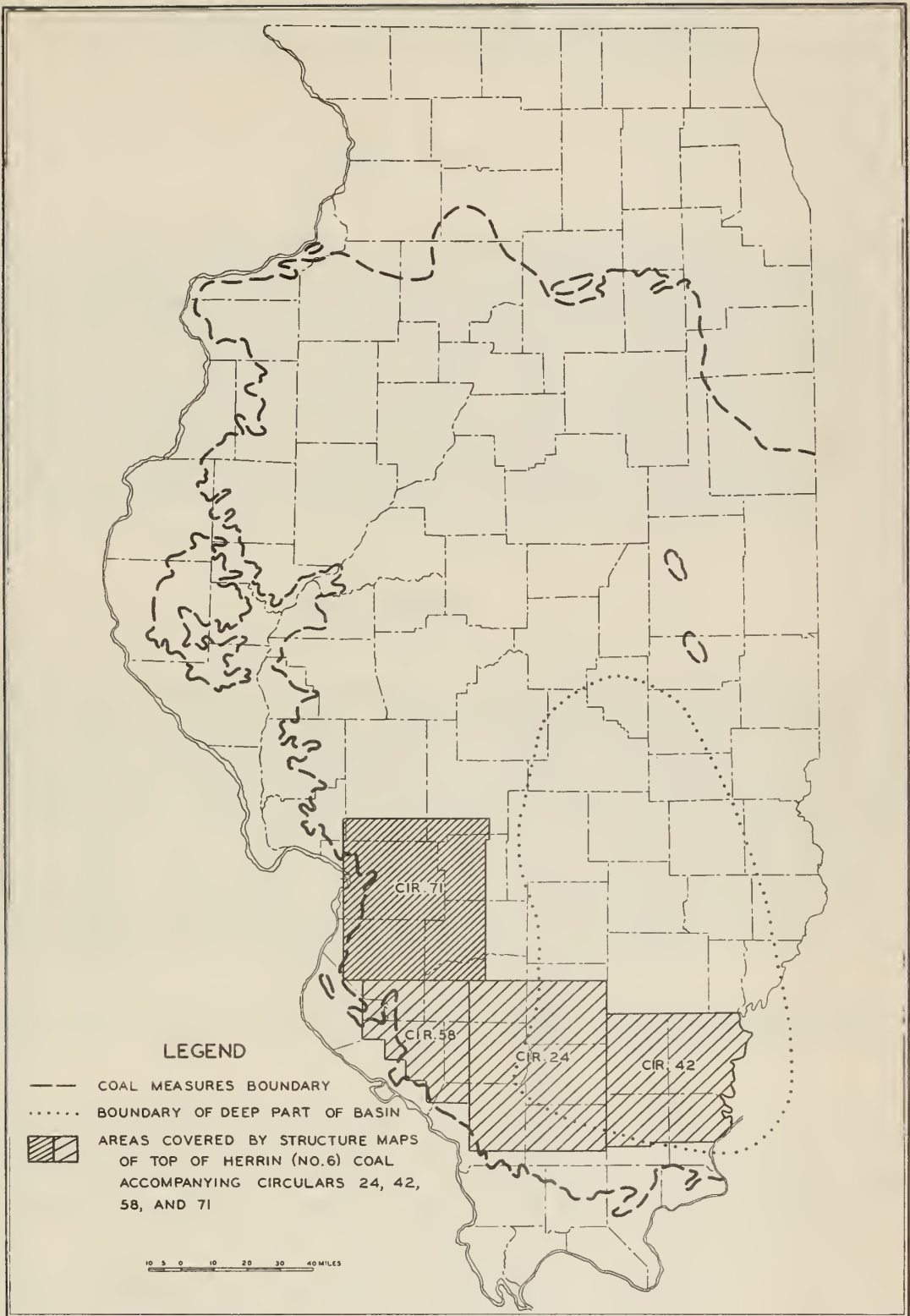


Fig. 1. - Index map.

STRUCTURE OF HERRIN (NO. 6) COAL BED IN
MADISON COUNTY AND WESTERN BOND, WESTERN CLINTON,
SOUTHERN MACOUPIN, SOUTHWESTERN MONTGOMERY,
NORTHERN ST. CLAIR, AND NORTHWESTERN WASHINGTON COUNTIES, ILLINOIS

BY

J. NORMAN PAYNE

This circular presents a brief discussion of the structural features of the Herrin (No. 6) coal bed in Madison County and adjacent parts of counties to the north, east, and south (see index map, fig. 1). The north and south boundaries are respectively the north line of T. 7 N., and the south line of T. 1 S.; the east and west boundaries are respectively the east line of R. 3 W., of 3rd P.M., and the west line of R. 9 W. of 3rd P.M. The first part of the circular is a discussion of the structure in relation to coal mining and the second part is a discussion by Dr. A. H. Bell on the relation of the structure to possible oil and gas accumulation.

Coal Mining

The coal production from this area has been almost entirely from the Herrin (No. 6) coal bed. Some small local mines near Alton have obtained coal from the Colchester (No. 2) coal bed. The Blair (No. 5) coal bed has been encountered in some drill holes in the area and has been mined for local use along the Mississippi Valley bluff-line and in tributary valleys between French Village and Millstadt, but this coal bed is not thick enough to mine commercially under present competitive conditions. There were 25 active shaft mines shipping by railroad in this area in 1939, working the Herrin (No. 6) coal bed. They were distributed by counties as follows: Bond, 1; Clinton, 2; Macoupin, 5; Madison, 6; and St. Clair, 11.

There are three active stripping operations lying completely or partly within the area, at one of which the mining company is also making coke.

About 1400 square miles of the area was originally underlain by the Herrin (No. 6) coal bed with a workable thickness of 5 to 6 feet. Of this original quantity of coal, about 100 square miles has been removed or rendered unmineable by mining. The estimated remaining reserve for the area (calculated on the basis of about 1,000,000 tons per mile foot) is approximately 7,000,000,000 tons. So little is known about the reserve that may be present in lower beds that no estimate is made of the quantity of such coal other than to state that its present value is probably relatively very small compared with the value of the coal in Herrin (No. 6) coal bed.

The area lies at the threshold of the cities of St. Louis and East St. Louis, and the operation of the mines depends largely upon the demand for coal in these two cities and their suburbs. Convenient and cheap means of transportation are widely available to these adjacent markets. Up to the present, the mines have been dependent on the railroads for transportation to reach more distant markets, and little or no use has been made of river transportation facilities.

Structural Features of Special Interest with
Respect to Coal Occurrence and Coal Mining

The Herrin (No. 6) coal bed has a general regional easterly dip. The highest known altitude of the bed in the area is 585 feet above sea-level in NW. $\frac{1}{4}$ NW. $\frac{1}{4}$ SW. $\frac{1}{4}$, sec. 10, T. 1 S., R. 9 W., at Millstadt, and the lowest known altitude is 13 feet above sea-level in NW. $\frac{1}{4}$ NW. $\frac{1}{4}$ SE. $\frac{1}{4}$, sec. 26, T. 3 N., R. 3 W. The distance between these two points is 40 miles, indicating a regional dip of about 14 feet per mile.

The eastward dip is not regular, and in several places, as near Belleville, Shiloh, O'Fallon, and Hamel, the coal dips at a rate of 50 feet per mile for short distances. Locally there are anticlines, domes, terraces, platforms, and basins produced by reversal of dip or essential horizontality of the coal bed. The location and character of these structures should be considered in choosing a site for mining operations, although it is probable that these structures are rarely of sufficient magnitude to have any serious effect on mining.

Faults are relatively rare, have small displacement and brief extension, and because they are unimportant they have not been mapped. Displacements of the coal bed, in some places as much as 5 feet, have been observed in the mines, but such faults commonly do not continue into the strata above and below the coal bed.

The map which has been prepared in blue-print form to accompany this report is based on unevenly distributed datum points. Drilling and mining operations are concentrated in the west part of the area, particularly near the coal outcrop, and in the vicinity of the various oil and gas pools in the area. Hence, in general, it is possible to show the structure with greater accuracy and detail in the west than in the east part of the area. The small map of the Bartelso oil field (fig. 2) has been prepared in order to show an alternative interpretation of the structure in accordance with apparent geological conditions not revealed by strict adherence to the engineering principles that control the positions of the contours on the large map that accompanies this report. This interpretation is

based mainly on the assumption that the coal bed declines in all directions from the Bartelso oil field and that the closed depressions on the north and south sides of the Bartelso field are actually extensions of synclines from the generally low area to the east.

Areas in which the No. 6 Coal Bed is Absent
or too Thin to Work

The coal is thin or absent in an area one to five miles wide, extending from the north boundary of the region (T. 7 N., R. 5 W., southeastern Macoupin County), southward along the Madison-Bond county-line into Madison County as far as Sebastopol (secs. 13 and 14, T. 3 N., R. 5 W.). Within this area the drill records show that the position at which the No. 6 coal bed and associated strata are normally found is occupied by sandstone and sandy shale which also extend above and below this position for many feet. The west boundary of this area, from the vicinity of New Douglas to Sebastopol, is very indefinite and is so indicated on the map by question marks along the boundary line.

Another, but smaller area in which the coal bed is thin or absent, is found in the north-central part of T. 7 N., R. 3 W., and along the east tier of sections of T. 7 N., R. 4 W. This area extends through the eastern side of the Panama Mine where an interruption of the coal has been variously reported as a fault and as a "cut-out." The best available information on this problem seems to indicate that it is due to a "cut-out" or so-called "fault of erosion."

A third area in which the coal bed is thin or absent is found in T. 1 N., R. 4 W., and in secs. 13, 14, 24, and 25, T. 1 N., R. 5 W. This area may be an extension of the area first described above, as drill records indicate that the coal bed thins considerably at and east of Aviston, but drilling data are too scanty to prove that these two areas are continuous. The data, however, indicate that the selection of this particular area as a site for mining operations should depend upon the result of thorough test-drilling.

Revision of Present Map and Preparation of Maps of Other Areas

The present map, like those of the areas to the south and southeast (Circulars 24, 42, and 58), is a progress map in such a form that additions and corrections can be readily made from time to time. Because of the large amount of new drilling that is being done in the State and the vigorous search for records of earlier drilling, it is expected that additional information will constantly be made

available for Survey use. It is doubtful, however, if a revision of the present map will be available for several months. Until revised, except for minor corrections, it will bear its original date. Subsequent revisions will be designated as such, carrying a new date of issue.

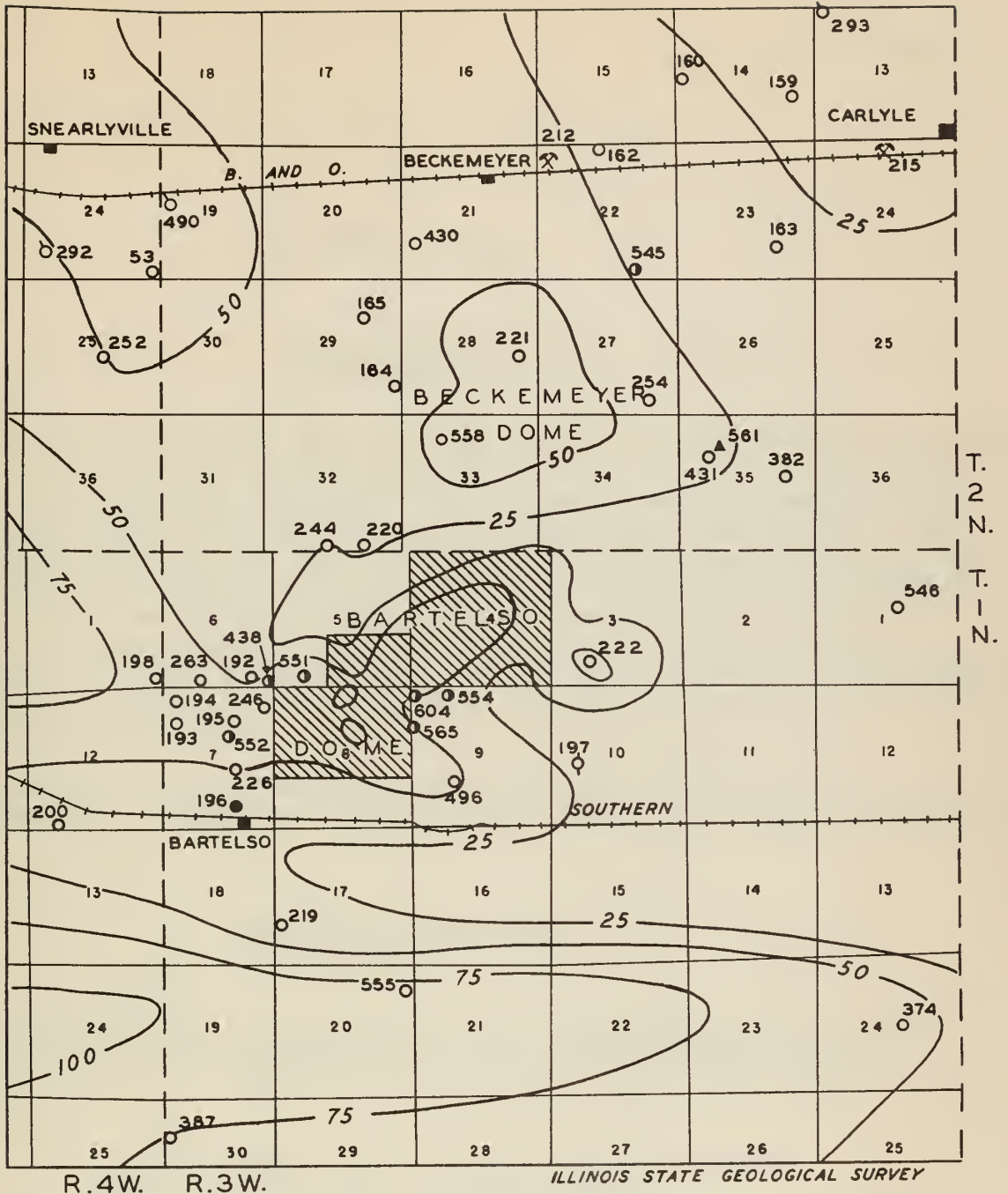
The accompanying map is the fourth of a series of seven showing the structure of Herrin (No. 6) coal bed in southern Illinois. It is contemplated that the next circular will be accompanied by maps of two areas north and northeast of the area represented by the present map. These two maps will represent most of Macoupin, Sangamon, Christian, Montgomery, and Shelby counties, and adjacent parts of Jersey, Greene, Morgan, Macon, Moultrie, Effingham, and Fayette counties.

References

Previously published data on the structure and occurrence of the Herrin (No. 6) and lower coal beds in this area may be found in the following publications:

- Bell, A. H., Oil possibilities of the Ayers anticline: Illinois Geol. Survey Illinois Petroleum No. 5, pp. 15-18, October, 1926.
- Bell, A. H., Recent development on the Ayers anticline: Illinois Geol. Survey Illinois Petroleum No. 16, June, 1928.
- Bell, A. H., Oil prospecting in Western Illinois on the basis of the structure of coal beds: Illinois Acad. Sci. vol. 20, pp. 293-296, 1928.
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- Cady, G. H., Coal stripping possibilities in southern and southwestern Illinois: Illinois Geol. Survey Min. Inv. Bull. 31, pp. 46-47, 1927.
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- Fenneman, N. M., Physiography of the St. Louis area: Illinois Geol. Survey Bulletin 12, p. 10, pl. 18, 1909.
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- Lee, Wallace, U. S. Geol. Survey Geol. Atlas, Gillespie-Mount Olive folio (no. 220), 1926.
- Moulton, Gail F., Proper testing for oil structures in Illinois and some areas deserving such testing: Illinois Geol. Survey Report of Investigations No. 6, 1925.
- Mylius, L. A., A restudy of the Staunton gas pool: Illinois Geol. Survey Bulletin 44A, 1919.
- Shaw, E. W., U. S. Geol. Survey Geol. Atlas, Carlyle and Centralia folio (no. 216), 1923.
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R. 4 W. R. 3 W.

ILLINOIS STATE GEOLOGICAL SURVEY

LEGEND

- DIAMOND DRILL HOLE
- CHURN DRILL HOLE
- ⊙ ROTARY DRILL HOLE
- ⊕ SKELETON LOG
- ⁴³⁰ NUMBERS CORRESPOND TO THOSE IN DATA SHEETS
- ⊖ DRILL HOLE WITH NO LOG
- ⊗ MINE
- ▨ CLOSELY DRILLED AREA
- ▲ OUTCROP
- CONTOUR INTERVAL 25 FEET

SCALE

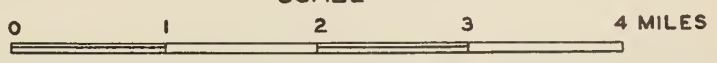


Fig. 2. - Alternative interpretation of structure of top of Herrin (No. 6) coal bed in the vicinity of the Bartelso oil field.

NOTES ON OIL AND GAS POSSIBILITIES

BY

ALFRED H. BELL

Introduction

Structure contour maps of coal No. 6 in southwestern Illinois have been found valuable in prospecting for oil and gas which occur mainly in beds below this horizon. The present map is revised in accordance with new data on coal No. 6 not previously available. The following discussion points out the principal differences between the present map and previously published maps and indicates what bearing these differences have on oil prospects in the various localities. Previous oil and gas prospecting and development in the area are briefly reviewed. Table 1 gives data on oil and gas pools in the area. This report does not include detailed discussion of pre-Pennsylvanian stratigraphy or structure.

A number of previous publications deal with the geology and mineral resources of parts of the area and these are listed on pp.6-7.

Structural Features

The principal structural features which may have influenced the accumulation of oil or gas in the area are discussed in turn. Most of these have been mapped and described in previous publications.

- (1) Staunton dome, sec. 14 and adjacent secs.,
T. 7 N., R. 7 W., Macoupin County.

The Staunton dome is described in: Bulletin 28, page 41; Mining Investigations Bulletin 11, page 37; and Bulletin 44A. A gas field which produced for three years from 1916-1919 was located on this dome. Production was from Pennsylvanian sandstone, and the average depth to top of pay in 18 gas wells was 461 feet. Average thickness of pay was 30 feet. The deepest well on the structure, drilled in 1931, had a depth of 2371 feet and tested the "Trenton" limestone.

The fact that mine levels were used in the present structural interpretation insures a greater degree of accuracy than was possible in previous maps.

Table 1.--(Continued)

Pool and County	Ayers gas, Bond	Bartelso, Clinton	Carlyle, Clinton	Collinsville, Madison	Frogtown, Clinton	Greenville gas, Bond	Sorento, Bond	Staunton gas, Macoupin
Depth to bottom of producing wells	945	1,008 (h) 2,447 (i)	1,055	1,400	957	993	1,893	491
Net average thickness of pay	5	24 (h) 9 (i)	20	20	7	x	5	x
Structure (g)	A	D	A	ML	D	A	D	A
Deepest zone tested to end 1940:								
Name	Devonian	Devonian	St. Peter	Silurian	Cypress	Devonian	Devonian	"Trenton"
	2,181	2,447	4,120	1,500	962	2,290	1,893	2,371

(1) Abandoned 1921, one well completed and abandoned in 1939.

- (2) Abandoned 1933
- (3) Abandoned 1923
- (4) Abandoned 1919

- (h) Cypress sandstone
- (i) Devonian limestone
- x Unknown
- y Data unavailable

a Areas where both oil and gas are produced, unless gas is marketed outside the field.

b Wells producing both oil and gas are classified as "Producing Oil." Gas wells are those producing gas, but include those producing wet gas, from which casinghead gasoline may be produced.

c Letters indicate type of operation: RP, field repressuring in its later life.

d Sil, Silurian; Dev, Devonian; Mis, Mississippian; Mis L, Lower Mississippian; Mis U, Upper Mississippian; Penn, Pennsylvanian.

c Ss, sandstone; Ls, limestone.

g A, anticline; ML, monocline-lens; D, dome.

The dry hole to the "Trenton" has undoubtedly discouraged further test-drilling for oil or gas on the Staunton dome.

- (2) Sorento dome, T. 6 and 7 N., R. 4 and 5 W., Montgomery, Bond and Madison counties.
- (a) New Douglas dome -- centers in sec. 3, T. 6 N., R. 5 W., Madison County.
- (b) Panama anticline -- centers in sec. 27, 28, 29, T. 7 N., R. 4 W., Bond County.

The Sorento dome was mapped and described by F. H. Kay and K. D. White in Mining Investigations Bulletin 11, 1914, and by R. S. Blatchley in Bulletin 28, 1914, page 41. A revised interpretation of the structure, making use of additional drilling data, by A. H. Bell in Illinois Petroleum 6, 1926, recognized two parts of the "Sorento dome" which were named respectively the New Douglas dome and the Panama anticline.

Details of the New Douglas dome do not appear on the present map because the crest occurs in an area where coal No. 6 is absent and where contours are not drawn. For this reason the name "New Douglas dome" is omitted from the map.

The New Douglas dome has been tested by two holes that penetrated the Lower Mississippian (Map Nos. 1 and 5) drilled in 1927 and one which reached the St. Peter sandstone (Map No. 132) drilled in 1937. In the last named well a solid petroleum residue was found in the samples in part of the Joachim formation (dolomite) from 2992 to 3047 feet, in the Glenwood formation (sandy dolomite) from 3047 to 3094 feet, and in the St. Peter sandstone from 3095 to 3101 feet.

The possibilities of finding oil in commercial quantity by further drilling on the New Douglas dome appear remote.

In the W. N. Lee - Sharf No. 1 well drilled on the Panama anticline in 1940 in the NW. $\frac{1}{4}$ SW. $\frac{1}{4}$ SE. $\frac{1}{4}$, sec. 27, T. 7 N., R. 4 W., Bond County, which tested the Devonian limestone, a small flow of gas was encountered in a Pennsylvanian sandstone from 556 to 596 feet. The estimated initial flow of the well was 500,000 cubic feet daily. A second well was drilled in the area offsetting the Sharf well. It had an estimated initial production of 1,000,000 cubic feet daily.

A dry hole to the gas sand was drilled one quarter of a mile north and east of last producing well. Since the top of the structure according to contours on coal No. 6 has been tested by a well drilled to the Devonian limestone (sec. 29) and no gas production was encountered in the gas sand, it appears that the area of gas production will be very limited. As yet, the gas from these two wells has not been marketed.

Although the Devonian possibilities of the Panama anticline are not necessarily exhausted by one test, the prospects do not appear favorable.

(3) Fosterburg-Staunton anticline.--An anticlinal nose extends from a point in sec. 10, T. 6 N., R. 9 W., about one mile northwest of Fosterburg, about 14 miles in a direction slightly north of east toward Staunton. There appears to be evidence of some degree of connection between the Fosterburg-Staunton anticline and the New Douglas dome along an axis passing through Livingstone in sec. 15, T. 6 N., R. 6 W.

According to available records there has been no testing for oil along the Fosterburg-Staunton anticline. The most favorable acreage on this structure indicated by the present map appears to be secs. 5 and 6 and northern parts of secs. 7 and 8, T. 6 N., R. 7 W., Madison County. Estimated depths at the common corner of these four sections are Devonian, 1465 feet; "Trenton," 2050 feet; and St. Peter, 2615 feet. In the absence of indication of structural closure prospects are not especially favorable.

(4) Donnellson anticline.--The Donnellson anticline is an eastward extension of the Panama anticline. The axis lies approximately along the Bond-Montgomery county-line in T. 7 N., R. 3 W., not shown on previous maps. No test drilling for oil has been done, and further structural data would be needed before selecting favorable locations for oil tests.

(5) Ayers anticline in T. 6 N., R. 3 W., Bond County.--The Ayers anticline has been described in several previous publications: Mining Investigations Bulletin 11, page 36; Bulletin 28, page 43; Illinois Petroleum Nos. 5 and 16. The present revised map shows more detail on the western part of the structure. A closed 175-foot contour is shown in the south part of sec. 20 and north part of sec. 29. The Ayers anticline itself has a smaller area than in the previous map and the syncline to the north has a larger area.

The extent of the Ayers gas field, which produces from the Aux Vases sandstone of the Chester series, appears to be fairly well defined. A test drilled in 1940 into the Devonian limestone, located near the top of the west end of the Ayers anticline, was a dry hole (Kingwood-Goffner No. 1, sec. 30, T. 6 N., R. 3 W., listed in Table 2). The "Trenton" has not yet been tested on the Ayers anticline, and if it is sufficiently porous it might produce. Estimated depth to "Trenton" at datum point No. 97 near the NW. cor. sec. 29, T. 6 N., R. 3 W., is 2880 feet.

(6) Reno anticline, secs. 21 and 22, T. 6 N., R. 4 W., Bond County.--The Reno anticline is a westward extension of the Ayers anticline and is connected with it by a saddle. The Sorrento pool, which consists of one well drilled in 1938 (Map No. 113) producing from the Devonian limestone, is located on the Reno anticline.

- (7) Old Ripley anticline, between Pocahontas and Old Ripley, sec. 24, T. 5 N., R. 5 W., extending from sec. 24, T. 5 N.; R. 5 W., Madison County, eastward through secs. 19, 20, 21, 22, and 23, T. 5 N., R. 4 W., Bond County. From the north part of sec. 23 an anticlinal axis extends east of north to sec. 6, T. 5 N., R. 3 W.

The structures here called Old Ripley anticline and Greenville dome were shown as one structure in previous publications and were called the Stubblefield anticline (Plate I of Mining Investigations Bulletin 11, Bulletin 28, and Report of Investigations 6, pages 16-17). The Old Ripley anticline may extend west across the area in which coal No. 6 is thin or absent in T. 5 N., R. 5 W.

Estimated depths for a point in the center of the NE. $\frac{1}{4}$ sec. 22, T. 5 N., R. 3 W., are: Devonian, 2225 feet; "Trenton," 3060 feet; St. Peter, 3600 feet.

- (8) Greenville dome.--The Greenville dome centers in secs. 22 and 27, T. 5 N., R. 3 W., and the Greenville gas field is located on it. Two dry holes to the Devonian limestone are located on the west flank of the Greenville dome drilled in 1911 and 1939 respectively, and one near the crest of the structure in sec. 22 (Map No. 160) drilled in 1940. This structure has untested possibilities for oil in the "Trenton" on its crest in the east part of sec. 22 and in sec. 27.

Several oil tests have been drilled in secs. 22 and 23, T. 5 N., R. 4 W., near the axis of the Old Ripley anticline. In the Ashby et al - H. F. File well No. 1, NW. cor. SE. $\frac{1}{4}$ SE. $\frac{1}{4}$ sec. 22, T. 5 N., R. 4 W., (Map No. 100) drilled in 1932, total depth 926 feet, oil shows in sandstone were reported in the driller's log from 878-881 feet and from 895-903 feet in what is probably the Aux Vases formation, Chester series. In the Ashby et al - File well No. 2, NW. cor. SW. $\frac{1}{4}$ sec. 23, T. 5 N., R. 4 W., (Map No. 101) drilled in 1933, an oil show in sandstone, probably Pennsylvanian, was reported from 654 to 658 feet, and gas was reported in a lower Chester sandstone from 815 to 822 feet. A third well in the vicinity (Map No. 109) drilled in 1934 reported no shows of oil or gas down to 1100 feet. These wells appear to have been favorably located on structure, and consequently further testing on the structure does not seem to be warranted.

- (9) Irishtown anticline.--The previous maps (Mining Investigations Bulletin 11 and Bulletin 28) show an anticline extending from the vicinity of Pierron in Bond County south of east for about 15 miles into the northern part of Clinton County. The present map shows the principal axis of a broad anticline extending from the vicinity of Sebastopol in Clinton County north of east for about 14 miles to a point northeast of Beaver Creek in Bond County.

A subordinate axis branches to the southeast in the north part of T. 3 N., R. 3 W., coinciding approximately with the major axis of the Irishtown anticline in the old maps. Inasmuch as the central part of the area of the general structure coincides largely with the Irishtown anticline of the old maps, it is thought desirable to retain the name. A show of oil was found in the Cypress sandstone in the Ohio Oil Company - Wilken well, NE. cor. SE. $\frac{1}{4}$ SW. $\frac{1}{4}$ sec. 10, T. 3 N., R. 3 W. (Map No. 15), drilled about 1912. Another well which tested the Bethel sandstone in the SE. cor. NE. $\frac{1}{4}$ sec. 11, T. 3 N., R. 3 W., drilled in 1939, did not report a show in either the Cypress or Bethel formation. The Kisl et al - Maibaum No. 1, NW. $\frac{1}{4}$ NE $\frac{1}{4}$ SE $\frac{1}{4}$ sec, 12, T. 3 N., R. 3 W., drilled in 1938, had an initial production of 40 barrels of oil and two barrels of water per day from the Bethel sandstone at 1166-1169 feet. The well was abandoned two months later because it was pumping salt water.

So far as the coal structure map shows, the best part of the structure in this vicinity has been tested to the Bethel. A large area in the south part of T. 4 N., R. 3 W., Bond County, has not been tested for oil, and it lies on the Irishtown anticline according to the present map. However, in the absence of detailed structural data it is recommended that test drilling to obtain further structural data be carried out before attempting to locate oil tests.

(10) O'Fallon dome.--On previous maps the O'Fallon dome is shown extending from a point $1\frac{1}{2}$ miles east of Belleville slightly east of north for 10 miles and plunging to the north. The present map shows that it is divided by an east-west syncline just north of O'Fallon, making a dome about four miles north of O'Fallon and an anticline south of O'Fallon extending west-southwest to the vicinity of Swansea. This anticline has been tested to the Devonian in well No. 804, drilled in 1939.

Swansea anticline.--The Swansea anticline extends from the north part of sec. 9, T. 1 N., R. 8 W., to the west part of sec. 2, T. 1 N., R. 8 W., and has a closure of about 50 feet. It has been tested by one well (Map No. 646) drilled in 1839 to 1141 feet or 604 feet below the top of the Chester. This is not shown in previous maps by the Survey. It has untested possibilities in the Lower Mississippian, Devonian, and "Trenton," estimated depths to tops being 550, 1450, 1825 feet, respectively, for locations in the center of the N. line of sec. 10, T. 1 N., R. 8 W.

(11) Aviston anticline. An anticlinal axis extends from a point east of Trenton in sec. 21, T. 2 N., R. 5 W., eastward about five miles through Aviston. Well No. 36 is located on the crest of a local closure near Aviston. It had a total depth of 1112 feet and probably penetrated nearly all of the Chester. Estimated depths to deeper formations are: Lower Mississippian 1100, Devonian 2250, and "Trenton" 3100 feet.

(12) Carlyle dome, secs. 2, 3, 10, and 11, T. 2 N., R. 3 W. Clinton County.--The detailed data used in the present map indicate two separate closures of the 50-foot contour, one largely in the productive area of the Carlyle oil pool, the other largely out of it to the southeast.

The Sowell et al - Schlaffly No. 1, 330 feet from E. line, 660 feet from N. line, SE. $\frac{1}{4}$ sec. 3, T. 2 N., R. 3 W., was favorably located on the coal structure and tested the St. Peter sandstone. Total depth of the well was 4120 feet. Further deep testing on this structure is not recommended.

(13) Belleville anticline.--Extending south of east from Belleville for a distance of about six miles is a plunging anticline on which no closure is indicated.

(14) Millstadt anticline.--The highest known part of the Millstadt anticline is in the W. $\frac{1}{2}$ sec. 10, T. 1 S., R. 9 W., but the structure is not fully outlined because it is close to the boundary of coal No. 6.

(15) Bartelso dome.--Two alternative interpretations of the structure of the Bartelso area are presented, one on the main map based on engineering data strictly applied; the other, a geological interpretation of the data which may be more nearly correct, accompanies the text.

Oil is produced from the Cypress sandstone, Chester series (Upper Mississippian) and from Devonian limestone. The "Trenton" limestone and St. Peter sandstone have been found dry on this structure.

As of May 24, 1941, there were 23 wells producing from the Devonian, and three temporarily abandoned wells, probably dry, in the Devonian. The limits of Devonian production are defined on the east and southeast but they are not yet defined in the western part of the field.

One well, Mosebach - Schlarman No. 1, NE. $\frac{1}{4}$ NW. $\frac{1}{4}$ NW $\frac{1}{4}$ sec. 9, T. 1 N., R. 3 W., drilled in 1941, total depth 4213 feet, tested the St. Peter sandstone, top 4175 feet. No shows of oil were reported in either the "Trenton" or the St. Peter.

(16) Beckemeyer dome, secs. 27, 28, 33, 34, T. 2 N., R. 3 W. Clinton County.--The Beckemeyer dome, according to the alternative interpretation (see fig. 2) is separated from the Bartelso dome by a narrow syncline. On the large map it is shown as a northern extension of the Bartelso dome.

The Beckemeyer dome has been tested by a dry hole which tested the Cypress (Map No. 221, drilled in 1937, sec. 28, T. 2 N., R. 3 W., Clinton County) and a small producer in the Devonian

(Map No. 558, drilled in 1940, sec. 33, T. 2 N., R. 3 W., total depth 2570 feet, top of the Devonian at 2500 feet, initial production four barrels of oil and 16 barrels of water, pumping December 3, 1940).

This structure has not been tested to the "Trenton" nor has the extent of Devonian production been defined.

Additional Structures

Numerous minor flexures occur in the general vicinity of Freeburg. A very small area of closure is shown east of Venedy, but it is much less pronounced than the Venedy dome shown on previous maps and is probably insignificant so far as oil prospects are concerned.

Unnamed anticlinal noses plunging eastward:

- (a) Near Prairietown; secs. 15, 16, 17 and 18, T. 6 N., R. 7 W., Madison County.
- (b) Southeast of Bethalto, secs. 8, 9, 10, 11, 12 and adjacent secs. to south, T. 5 N., R. 8 W.
- (c) North of Edwardsville to south of Carpenter, secs. 25, 26, 27 and adjacent secs. to south, T. 5 N., R. 8 W., secs. 19 and 20, T. 5 N., R. 7 W.
- (d) South of Edwardsville, especially secs. 23 and 24, T. 4 N., R. 8 W., and secs. 19, 30, 29, 28 and 27, T. 4 N., R. 7 W.
- (e) East of Glen Carbon, sec. 35, T. 4 N., R. 8 W., and sec. 2, T. 3 N., R. 8 W.
- (f) Donkville, secs. 21 and 22, T. 3 N., R. 8 W.
- (g) South of Troy, secs. 29, 28, 21 and 22, T. 3 N., R. 7 W.
- (h) South of Caseyville, secs. 19, 20, 21, 22, 26, 25, 36, T. 2 N., R. 8 W.
- (i) South of Bartelso, secs. 22, 23 and 24, T. 1 N., R. 4 W., and secs. 19-24, T. 1 N., R. 3 W.

Areas in which Coal No. 6 is Thin or Absent

As mentioned above, coal No. 6 is thin or absent in certain areas as for example along the Madison-Bond county-line. Hypotheses to explain the absence of the coal in these areas have been discussed at another place in this report (p. 5). That the areas of absent coal coincide with structures favorable to the occurrence of oil seems improbable, in view of the fact that two dry holes to the Ordovician were located in or close to the largest area where the coal is absent. These are the Huber-Kunz well (Map No. 132, sec., 11 T. 6 N., R. 5 W.) drilled to the St. Peter sandstone close to the boundary of the main area of absent coal, which was a dry hole; and another well (Map No. 374, sec. 22, T. 4 N., R. 5 W.) tested the Glenwood formation, which lies just above the St. Peter in the area of absent coal, and was a dry hole.

Table 2.--Selected List of Deep Drillings

Driller, farm, well no., year drilled	¼ Sec.	Location		County No. on map	Total depth	Sur. elev.	Depth	
		Sec. T. R.	R.				to top L. Miss.	to top of Devonian
Bond County								
Eason Oil Co. - Land Bank 1 (1939)	NE NE NW	24	4N 3W	137	1340	495.3	1261	
Weinschel - Riecker 1 (1939)	SW SW SW	6	4N 4W	136	2108	551.5	1027	2023
Lindsay Bros. & British Amer. -								
Frutager 1 (1938)	SW SW SW	33	4N 4W	116	1130	514.0	1029	
Jarvis Bros. - Zeeb 1 (1939)	NE NW SE	21	5N 3W	148	2456	568	1196	2321
Seaboard Oil Co. - Tremblay 1 (1940)	NW SE SE	22	5N 3W	160	2369	530	1135	2234
Ohio Oil Co. - Smith 1 (1911)	SW NE SE	29	5N 3W	69	2391	547.8	1185	2330
Producers Oil Co. - Plog 1 (?)	SE SE NW	4	5N 4W	44	2019	518.7	900	1965
Producers Oil Co. - Wall 1 (1911)	SW SW NE	16	5N 4W	50	2155	571.4	1025	2118
Ohio Oil Co. - Niedheimer 1 (?)	NW NW NW	30	5N 4W	25	2060	547.7	944	2010
Ashby et al - Stanton 1 (1933)	SE SE SW	18	6N 3W	4	1095	594.2	1022	
Kingwood - Gaffner 1 (1940)	SW SE NE	30	6N 3W	*	2181	582	1011	2070
File et al - Barron 1 (1938)	SE SE NW	21	6N 4W	131	1900?	493.1	785	1813
Universal & DeMayo - Molder 1 (1938)	NW NE SW	24	6W 4W	114	2045	581.1	987	1885
Huber Drilling Co. - Kuntz 1 (1937)	SE NW NW	11	6N 5W	132	3101	603.5	804	
Harr - Thacker 1 (1940)	SE NE NE	29	7N 4W	139	1965	593	838	1958
Clinton County								
Fields - Zachary 1 (1940)	SJ SW NE	1	1N 3W	546	2658	422		2553
Mosebach - Robben 1 (1940)	SE SW SE	5	1N 3W	494	2460	472	1265	2416
Ferrelly - Bergeman 1 (1938)	NW SW NW	30	1N 3W	387	1403	414.3	1263	
Sowell - Schlafly 1 (1941)	SE NE SE	3	2W 3W	557	4120	459.5	1310	2514
Ohio Oil Co. - Maria Smith 30 (1924)	NW NE NE	10	2W 3W	155	2620	469.0	1320	2530
Trumbull - Ackman 1 (1940)	SE SW SE	22	2N 3W	545	2730	464	1370	
Ohio - Herzog 1 (1911)	NE SW SE	23	2N 3W	163	2733	467.1	1375	2600
Snell and Goldschmidt - Shaefer 1 (1940)	SW NE NW	33	2N 3W	558	2570	454	1382	2500
Tatum - Voss 1 (1940)	C SW NE	15	2N 4W	569	2440	460	1187	2315
Trumbull - Peters 1 (1940)	SE SE SE	33	2N 4W	556	3305	445	1200	2346
Trenton Oil & Gas Co. - Ricman 1 (?)	NE NW NE	8	2N 5W	31	2034	482.7	948	2019
Trumbull - Dillman Estate 1 (1940)	NE SE NE	12	2N 5W	*	2170	470		
Miller - Schmidt 1 (1940)	C W W SE	35	2N 5W	*	2295	440.4	1095	2193

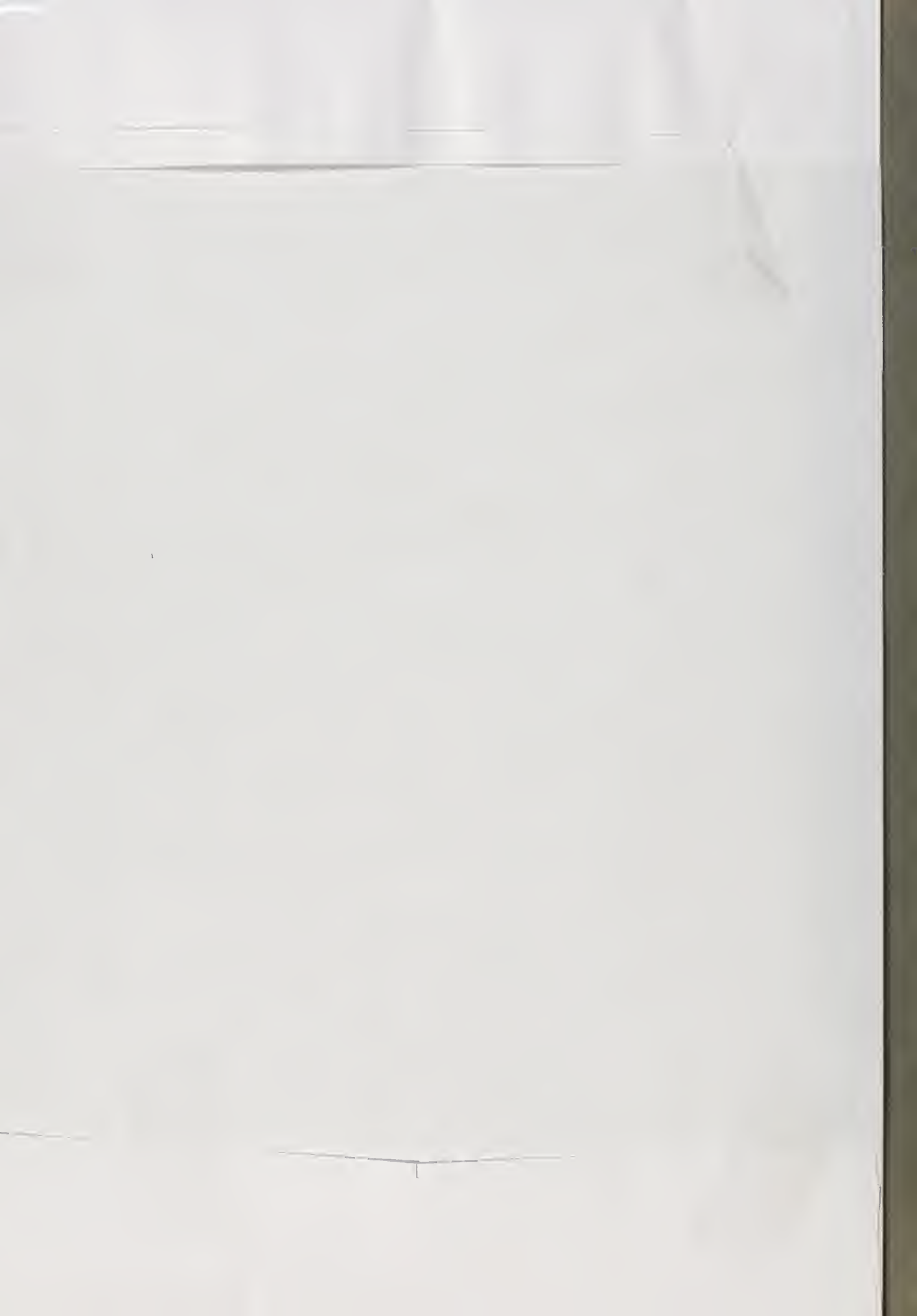
Table 2.--(Continued)

Driller, farm, well no., year drilled	1/4 Sec.	Sec.	T.	R.	County No. on map	Total depth	Sur. elev.	Depth		
								to top L. Miss.	to top of Devonian	
Driller, farm, well no., year drilled	SE SE NE	11	3N	3W	434	1170	476.9			
Noelkomper - Kile 1 (1939)	NW NE SE	12	3N	3W	427	1187	474.5			
Kesl - Maibaum 1 (1939)	SW SE SW	17	3N	3W	17	2430	466.5	1210	2358	
Ohio Oil Co. - Petermeyer 1 (1911)	SE NE NW	22	3N	3W	428	1150	459			
Sappington - Hilgoman 1 (1938)	NW NW NE	34	3N	4W	429	1212	464.4	1104		
Lindsey - Boenhoff 1 (1939)	SW SW NE	4	1S	5W	439	1095	403	1002		
Williams & Goldschmidt - Western Catholic Union 1 (1939)	C S SE SE	18	1S	5W	440	1271	399.4			
Harris - Haeg 1 (1939)										
Macoupin County										
Madison Coal Corp. - Mine #5 (1924)	C N NE NW	1	7N	6W	358	750	681.7	724	1585	
Duncan Bros. - Woolridge 4 (1951)	SE NW NE	23	7N	7W	293	2307	608	675		
Madison County										
Booske - Riegel 1 (1940)	NE SE N.	17	5N	5W	*		548		1986	
Simmel - Kellar 1 (1939)	NE NE SE	7	3N	8W	348	1367	418.5		1281	
Ohio Oil Co. - Stifel 1 (1914)	S. N. E	14	3N	8W	162	2184	557.5	479	1630	
Valley Oil Co. - Look 1 (?)	N. N. NE	1	3N	9W	408	2020	422.4	329	1233	
Jennings Bros. - Mossiman 1 (1940)	SE SW NW	22	4N	5W	374	3270	527.5	973	1960	
Madison Coal Corp. - Drill Hole 6 (1926)	SW SE SW	26	4N	8W	96	2500	502.6	447	1457	
Cherry and Kidd - Leef 1 (1940)	NE NW SE	5	5N	5W	424	1981	599.6		1920	
Wilson - Dauderman 1 (1940)	SW SW SW	1	5N	6W	375	1880	569.6		1827	
Baldwin - Daeber 1 (1940)	C NE SE NE	23	5N	6W	*	1910	551		1875	
Havelka - Fee: (1935)	SW SW NE	24	5N	8W	145	1987	479.8	547		
Jones et al - Early 1 (1940)	NW NW NE	30	6N	5W	430	1917	599.6	856	1812	
Montgomery County										
Taliaferno - Novak 1 (1910)	SE NE NW	11	7N	4W	*	1202	625	950		
Skiles et al - Nieman 1 (1941)	SE SW NE	9	7N	5W	*	863	648	786		
St. Clair County										
Algona Petrol. Co. - Muehler 1 (1939)	S. E NE	7	1N	6W	809	2252	439.5	875	1811	
Doctol 2 (1911)	NE SE SE	31	1N	6W	40	2151	426.7	740	1740	

Table 2.--(Continued)

Driller, farm, well no., year drilled	¼ Sec.	Sec.	T.	R.	County No. on map	Total depth	Sur. elev.	Depth to top of L. Miss.	Depth to top of Devonian
Mason, Wagner et al - Gundlach 1 (1927)	NE NE SW	24	1N	8W	30	1995	505.9	553	1475
Lockwood - Dyroff 1 (1924)	NW NE	26	1N	10W	0	2904	590		800
Matches and Leach - Bear 1 (1939)	NE NE SW	23	2N	6W	803	1925	493.4	905	1764
McIlwain - McNulty 1 (1939)	SW SW SE	32	2N	7W	804	1734	616.9		1566
Monks Mound (?)	NW NW NE	2	2N	9W	10	2100	437.0	315	1425
Mason - Funk 1 (1928)	NW NW NE	14	1S	7W	312	2265	423.9	690	1665
Prospecting Development Co. - Smithton (1908)	SE NE NW	33	1S	8W	92	1368	477.0		197
Washington County									
Gordon - Reinhardt and Scott 1 (1938)	C S SE SE	12	1S	3W	109	1551	440.1		
Yoch - Barrenpohl 1 (1936)	NE NE SE	34	1S	5W	82	1068	403.9		

* Not shown on map; well drilled after data were assembled.
 O Out of area of map.



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