STATE GEOLOGICAL SURVEY OF KANSAS

RAYMOND C. MOORE, Ph. D., Sc. D.,
State Geologist and Director

KENNETH K. LANDES, Ph. D.,
State Geologist and Assistant Director

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EXPLORATION FOR OIL AND GAS IN WESTERN KANSAS DURING 1940

By WALTER A. VER WIEBE

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CONTENTS

ILLUSTRATIONS

EXPLORATION FOR OIL AND GAS IN WESTERN KANSAS DURING 1940

By Walter A. Ver Wiebe

ABSTRACT

Drilling activity and exploration for oil and gas in western Kansas went forward at a rapid pace during 1940. A total of 1,220 new oil wells and 48 gas wells were completed. The new potential production amounted to 2,128,000 barrels per day, according to tests made on initial capacity of individual wells by the State Corporation Commission. The total production for the year exceeded 66,000,000 barrels, which is only slightly less than the maximum production of 70,750,000 barrels for 1937. In gas production a new record of 85,000,000,000 cubic feet was attained. Of 174 wildcat test wells, 76 were drilled at least 2 miles from known oil pools and are therefore classified as rank wildcats. Of these, 11 were successful in finding new oil pools and one found a new gas pool; important new reserves were thus added to those already available in Kansas. Considering the hazards of drilling, the ratio of one successful well to six test holes is very good. The ratio is even more favorable when the total number of test wells, 174, is compared to the total number of new oil pools, 22. Of these pools, Russell county accounted for five, Barton county and Stafford county for four each, Ellis, Ellsworth, and McPherson for two each, and Graham, Phillips, and Rice for one each. It is significant that Phillips and Graham counties, which lie at the western border of the explored territory, each acquired a second pool during the year. In addition to the new areas opened to exploitation, new producing zones were found in 19 of the older pools.

The greatest drilling activity was centered in the Stoltenberg, Bemis, Burnett, Bornholdt, Hall-Gurney, Laton, and Trapp pools. Among the exploratory wells the most interesting was the Stanolind No. 1 Judd test well in Kearny county. This well had favorable shows of oil at several levels and was drilled to sufficient depth to test adequately all probable producing zones. Although it was not a commercial success, this test well will undoubtedly be the forerunner of further wildcat drilling.

INTRODUCTION

For several years the State Geological Survey of Kansas has published reviews of oil and gas development in the state. The first of these was published in 1928 as Mineral Resources Circular 1. The most recent was Bulletin 28, which appeared in July, 1940, and which reported oil and gas exploration in western Kansas to the end of 1939. The purpose of this report is to record activities to the end of 1940.

In Mineral Resources Circular 10 the history of oil production in western Kansas was traced from the time of the discovery of the earliest pools to the end of 1937, and available knowledge of surface geology and subsurface stratigraphy was summarized. The stratigraphic sequence in each county in which oil or gas had been discovered was described, with special reference to the lithology of the individual formations. Data on production, number of wells, producing zones, and location of all pools were presented in statistical tables. In Mineral Resources Circular 13, the same kind of information for 1938 was presented.

In 1940 the search for oil and gas went on without interruption. Although there were no sensational developments to be recorded, the results of routine operations are no less impressive than those for the preceding year. The efforts of oil companies were concentrated on extending known fields, chiefly in Barton, Ellsworth, Russell, Rooks, and Stafford counties. Wildcat drilling was not neglected, as attested by the fact that 76 rank wildcat wells were completed, 11 of which in western Kansas were successful in finding new oil pools. It might be pointed out that in Kansas an arbitrary standard has been set up for classifying wildcat wells, according to which any test well located 0.5 mile or more from a producing well is classified as a wildcat well, and a rank wildcat is a test well that is located 2 miles or more from a producing well or pool. The figures given above concerning wildcat drilling in western Kansas apply only to rank wildcats. They reveal that in 1940 the ratio of dry holes to successful wells was approximately six to one.

In 1940 there were 1,890 wells completed in eastern and western Kansas. This figure is somewhat lower than that given in several trade journals, because it does not include wells that were deepened or wells that were recompleted in a different geologic zone. Of these 1,890 wells, 1,423, nearly three-fourths of all wells, were completed as commercial oil wells (1,220 in western and 203 in eastern Kansas). The commercial gas wells completed during the year number 58, of which 10 are in eastern and 48 in western Kansas. Of the dry holes, 147 are in eastern Kansas and 262 are in western Kansas. The total initial daily potential capacity of the new wells drilled in 1940 is 46,000 barrels in eastern and 2,128,000 barrels in western Kansas. In this connection it is interesting to note that the state of Kansas produced 66,145,000 barrels of oil in 1940. The number of wells contributing to this total is 20,779. Thus the increase over the 1939 production of about 58,000,000 barrels is considerable. It will be

recalled that the peak production in 1937 was 70,761,000 barrels. Another earlier peak had been reached in 1917, when the quantity produced and sold was slightly more than 45,000,000 barrels. The production of gas probably reached a maximum in 1940, when it exceeded 85,000,000,000 cubic feet. Between the 1908 peak of 80,000,000,000 cubic feet and the 1940 production, the yield was much less, reaching a minimum of 16,000,000,000 cubic feet in 1921.

The total of 1,890 wells drilled in 1940 represents a large increase over the 1939 total of 1,458. It is interesting to recall that the first peak was reached in 1904, when 2,782 wells were drilled. The number decreased rapidly to 368 in 1907, but rose to the second and highest peak in 1918, when 4,671 wells were completed. It is somewhat surprising that in the period between 1904 and 1912 more gas wells than oil wells were completed. Between the peak of completions in 1918 and the somewhat lower peak in 1937, the low point was reached in 1931, when only 470 wells were completed.

In the matter of new pools discovered, Kansas again ranks high among the states. The exact number depends somewhat upon whether a "new" area is interpreted as a new pool or a long extension of an old pool. Unfortunately the matter of obtaining maximum allowable production also enters into this question. Often the decision regarding a new pool cannot be made until other wells are drilled in the area. Therefore, the figures given in this report may differ from those presented in the trade journals. Table 1 lists 22 new oil pools and 1 new gas pool. Trade journals are also inclined to list as new pools the areas in which oil is discovered in a new producing zone in an old pool. In table 1 such new discoveries are not listed, but in 1940 no less than 19 discoveries of this type were made in Kansas, 2 of which are listed as new zones in pools that are classed as new pools for 1940. In other words, several producing zones were found in some of the new pools discovered in the last year.

New Geological Information.—No new producing zones were tapped that had not previously been found to be productive elsewhere in the state. It is common, for example, to find the Arbuckle mentioned as a new zone in a pool that had previously produced only from the Lansing-Kansas City limestones, or vice versa. In some fields the new zone is the Simpson (sometimes called "Wilcox") and in some it is a porous zone in the Pennsylvanian system.

Two new producing zones that deserve some comment are the "Wabaunsee lime" and the "Wabaunsee sand". These terms were introduced by the Nomenclature Committee (representing the Mid-

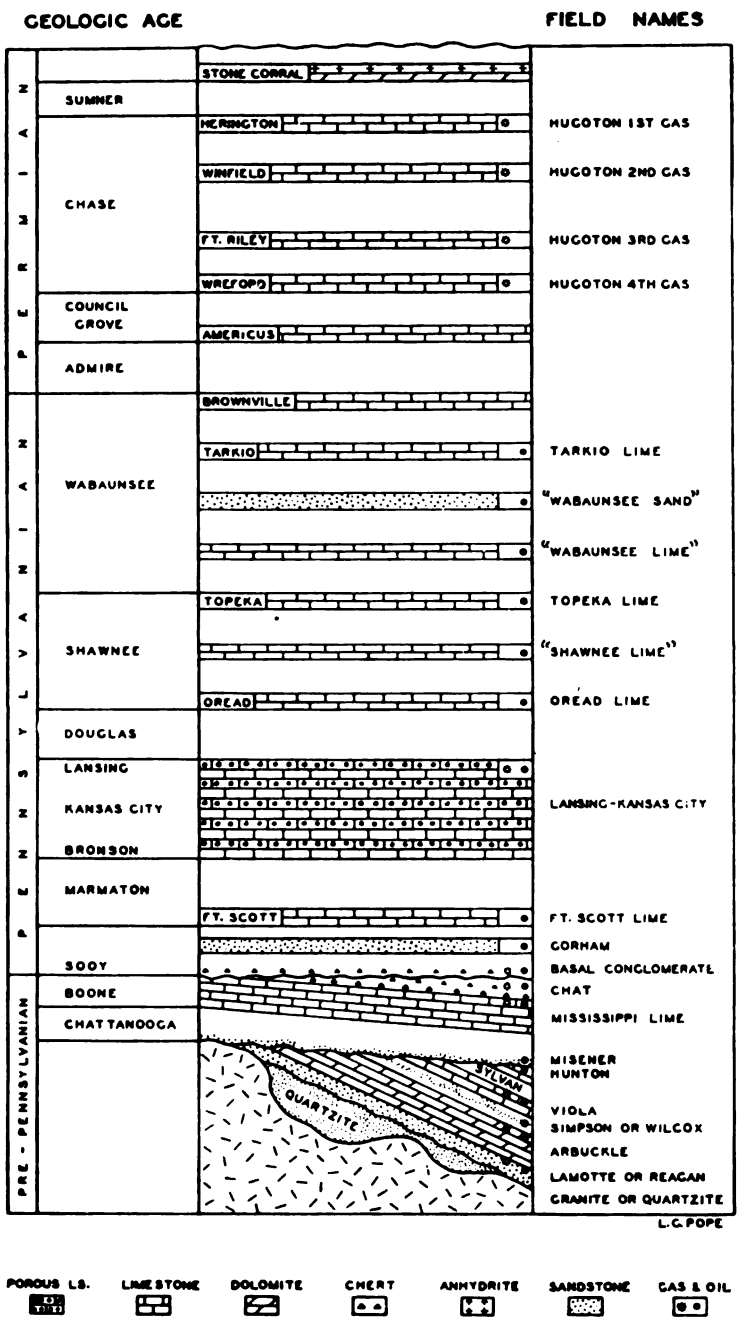

FIG. 1. Producing zones in western Kansas.

continent Oil and Gas Association and the Kansas Corporation Commission) to indicate any part of the Wabaunsee group that may be productive, now or in the future. Formerly an attempt was made to decide whether the limestone might be the Howard limestone, which lies near the base of the Wabaunsee, or possibly the Tarkio limestone, which lies some distance above the Howard. Similarly it was known that persistent sandstone bodies lie within the Wabaunsee group and an attempt was made to decide which one might be productive in a given area. The difficulty of determining the exact surface equivalent of underground producing zones in this part of the geologic section makes use of "Wabaunsee lime" and "Wabaunsee sand" desirable. These names were used for the first time in the Hall-Gurney pool. A similar name is used for a new zone in the Krier pool, where oil has been found in the Shawnee group at an indeterminate stratigraphic position (fig. 1).

Most Active Pools.—The pools most active in 1940 were Stoltenberg in Ellsworth county, Bemis and Burnett in Ellis county, Bornholdt in McPherson county, Hall-Gurney in Russell county, Laton in Rooks county, Trapp in Russell county, and Silica in Barton county. Important extensions were also made to other pools in various parts of the state and these will be discussed by counties in alphabetical order.

In the northeastern part of Barton county much drilling in and near the Prusa and Krier pools resulted in the addition of many wells, one new pool (Prusa Southeast), and three new producing zones. In the Krier area new producing zones were found in the Topeka limestone, the Lansing-Kansas City limestones, and the Arbuckle dolomite. Thus this township is now known to have six producing zones: the Shawnee, Topeka, Lansing-Kansas City, Sooy, Arbuckle, and Lamotte. The first four named are Pennsylvanian, the fifth is Ordovician, and the sixth is Cambrian. In other parts of the county wildcat drilling was successful in finding three new oil pools, which have been named the Bird, Hammer, and Wondra pools. The unflagging drilling campaign within and around the large Silica pool produced two important extensions, which greatly increased the size of this phenomenal pool. According to the Kansas Nomenclature Committee, the Silica pool now includes the Silica South, Ellinwood, Ellinwood West, Clawson, Marchand, Marchand West, and Wolf pools. It now has 710 wells as compared to 624 wells at the end of 1939.

In Ellis county the Bemis pool, to which the old Shutts pool had been joined in 1939, continued in the limelight. The number of

wells at the end of 1940 was one third larger than at the end of the preceding year. In the sensational Burnett pool the number of producing wells was doubled. This statement is also true of the Blue Hill and the Koblitz pools, but both are much smaller than the Burnett pool. Important additions or extensions were made to the Marshall and Walters pools. Two new pools were added to the Ellis county list in 1940. They have been named the Bemis-Shutts West and the Herzog pools. Both produce oil from the Arbuckle dolomite, the common producing zone in this part of the state.

No county witnessed a more sensational revival than did Ellsworth county. Numerous wildcat wells drilled northwest and southwest of the old Stoltenberg pool proved that this pool is considerably larger than had been supposed. One of the wells served as a connecting link with the old Stratman pool and the name Stratman has therefore been taken from the list of pools. At the end of 1940 two outpost wells are still far enough removed from the main pool to demand separate pool classification. The names used for these pools are Stoltenberg Southwest and Stoltenberg West. The excitement provoked by these extensions to the old Stoltenberg area spread southeast toward the old Wilkins area, where the number of producing wells is now twice as great as it was a year ago.

Graham county became prominent, although it entered the ranks of the oil-producing counties only last year. Considerable publicity was given to the discovery of a second oil pool, Penokee, in this county, because it was believed that a producing zone entirely new for Kansas had been found. The discovery well was drilled by Shields on the Paxson farm and was reported to have found oil in the Marmaton group. Most recent determinations on well cuttings from the discovery well indicate that it produces from the lower portion of the Lansing-Kansas City limestone.

In McPherson county the feverish drilling campaign in the Bornholdt area, which began in 1939, continued unabated during 1940. Connecting wells were drilled between the Bornholdt pool and the Bornholdt-North pool, thus eliminating one pool name from the list. The total number of wells at the end of 1940 was more than 140, as compared with only 16 at the beginning of the year. In the northeastern part of the county an attempt to extend the Roxbury pool resulted in the discovery of a new pool, known as the Henne pool after the farm on which the first well was drilled. A second new pool for this county is the Bitikofer pool, which is located in the east-central part of the county. Range 4 is now the only range in the county in which no oil pools have been found.

Another county in the far northwestern portion of Kansas that attracted attention in 1940 is Phillips county. It will be recalled that this county was first mentioned in the report for 1939, when the Bow Creek pool was found. In 1940 the Cities Service Oil Company drilled a deep test well on the Ray farm in sec. 32, T. 5 S., R. 20 W., which found commercial quantities of oil at a depth of 3,540 feet in the Lamotte or "Basal" sand, of Cambrian age. The large potential production of the discovery well encouraged a rapid drilling campaign so that by the end of the year five producing wells had been drilled in the new Ray pool.

In Rice county considerable drilling north and northeast of the old Chase pool developed much additional acreage productive of oil. It will be recalled that the Cramm and Soeken pools had been joined to the Chase pool in 1939. By the end of 1940 it seemed that the Campbell pool would also become part of the Chase pool and that the probability was great that the Midway and the Keesling pools might also be absorbed. In this report, however, these pools are still treated separately. One new pool was added to the list of pools in Rice county—the Karber pool, which was discovered by Carlock when he drilled a test well on the Karber farm in sec. 7, T. 19 S., R. 10 W. At first it was suggested that this pool be joined to the Rick pool in Barton county, because of the proximity of that pool. Nevertheless at the end of the year the Nomenclature Committee voted to regard the Karber as a separate pool.

In Rooks county a rapid drilling campaign in the Laton pool enlarged that pool to three times its former size. In Russell county, as might be expected, many wells were drilled. Many of the numerous pools of this county were considerably enlarged and five new oil pools were found. Thus this county again leads in the number of new pools recorded. The Greenvale pool was tripled in size, and wildcat drilling in its vicinity discovered the Greenvale Northwest pool. The other new pools are the Driscoll, the Lewis, the Mahoney, and the Davidson Northeast pool. The last lies in the southeastern part of the county and may prove to be an extension of the old Davidson pool in the northeastern part of Barton county. In the Lewis pool a limestone near the base of the Wabaunsee group was found to contain the oil. The Nomenclature Committee decided to name this producing zone the "Wabaunsee lime". The committee also voted to combine the Hall, Gurney, and Fink pools, inasmuch as connecting wells were drilled during the year. The new pool will henceforth be known as the Hall-Gurney pool. It contains not less than

13,600 acres. The remarkable Trapp pool was greatly expanded during the year, partly by the addition of the old Anschutz pool, which formerly lay to the northeast of the main pool, and partly through the drilling of many inside locations. This pool now has 678 wells, as compared to 549 wells at the end of 1939, and occupies 20,000 acres, and the limits are not yet known.

In Stafford county interest was not allowed to slacken during the year. The sensational Zenith pool was greatly extended and the number of wells was increased by drilling inside locations. Many of the newer wells produce from the Viola limestone instead of the Misener, which was formerly more important. In other parts of the county wildcat drilling disclosed four new oil pools and also new producing zones in old pools. The new pools are the Bedford pool and the Riley pool in the northeastern part of the county, the Roach pool in the northwest, and the Stafford pool near the center of the county. The last produces from the Viola limestone, which is somewhat unusual for this county. In the Sittner South pool the Arbuckle dolomite was added as a new producing zone. In the Snider South pool the Simpson sand was added as a new producing zone.

Important Wildcats.—Of the total of 231 wildcat wells drilled in 1940 in Kansas, 174 were drilled in western and 57 in eastern Kansas. Most of them were drilled within 2 miles to the nearest pool or well and would probably not be regarded as wildcat wells by operators in some other states. In western Kansas 76 test wells were drilled that at the time of drilling were located farther than 2 miles from any producing wells. Of these, 11 opened new oil pools and 65 were dry. These dry holes provided much geological information that can be used in the future to make possible more accurate locations. The most interesting ones will be described in this report, in alphabetical order by counties.

In Cloud county the Bells Wells Oil Company well in sec. 35, T. 6 S., R. 1 W., entered the Lansing at a depth of 1,980 feet, the Mississippian rocks at 2,530 feet, and the Arbuckle dolomite at 3,375 feet. The total depth of the hole is 3,407 feet.

In Gove county, on the western frontier of the oil territory, the Cities Service Oil Company test well in sec. 36, T. 13 S., R. 30 W., was drilled into the Arbuckle dolomite at a depth of 4,615 feet, but was drilled to a total depth of 5,169 feet and ended in pre-Cambrian granite.

The wildest of the wildcats was drilled in Kearny county by the Stanolind Oil Company on the Judd ranch. It finally reached a total

depth of 6,171 feet. Although good shows of oil were found at various levels none was important enough to provide a commerical well.

In Ness county, the Aladdin Oil Company well on the Jedlicka ranch, in sec. 33, T. 20 S., R. 23 W., reached Mississippian rocks at a depth of 4,348 feet, and the Arbuckle dolomite at 4,810 feet. The well was drilled 62 feet deeper without favorable indications and was abandoned as a dry hole.

In Pawnee county the Derby Oil Company, in partnership with several other companies, drilled a well on the Gilkison ranch, in sec. 21, T. 22 S., R. 16 W. It reached the Lansing limestone at a depth of 3,641 feet and the Arbuckle dolomite at 4,105 feet. It was abandoned as a dry hole at a total depth of 4,125 feet.

In Rooks county, the Cities Service Oil Company drilled a test well 9 miles west of the Faubion pool, in sec. 5, T. 6 S., R. 19 W., without favorable indications. Incidentally, it should be noted that the Cities Service Oil Company drilled more wildcat wells than any other operating unit. That company also drilled the deep test well on the Hansen ranch in sec. 15, T. 6 S., R. 19 W., in which the last zone likely to produce oil, the Arbuckle dolomite, was found at a depth of 3,635 feet. The well was abandoned at a total depth of 3,700 feet.

In Sedgwick county a very significant borehole was drilled by the Sunray Oil Company on the McMinn farm in sec. 14, T. 29 S., R. 2 W. This well was located on a very favorable trend, but was abandoned as a dry hole at a depth of 4,055 feet after having penetrated the Arbuckle dolomite 25 feet.

In the far west, in Sheridan county, a dry hole was drilled by the Cities Service Oil Company on the McGinnis ranch in sec. 10, T. 9 S., R. 27 W. In this well, which was closely watched by other interested operators, the Lansing limestone was reached at a depth of 3,835 feet, the Mississippian at 4,470 feet, and the Arbuckle dolomite at 4,600 feet. The well was drilled 265 feet deeper, but was abandoned at a total depth of 4,865 feet because no favorable showing had been found at any level.

In Stafford county numerous wildcat wells were drilled, three of which are classed as discovery wells of new pools. One of the rank wildcat wells that was not so successful is the test well drilled by Seaney on the Boyd ranch in sec. 4, T. 21 S., R. 14 W. This well was abandoned at a total depth of 3,646 feet.

In Trego county a very interesting test well, Bartlett No. 1 Pfan-

nenstiel, in sec. 30, T. 13 S., R. 25 W., drilled into the Lansing limestone at a depth of 3,690 feet, the Mississippian at 4,288 feet, and the Arbuckle dolomite at 4,650 feet. Drilling was continued to 4,684 feet, and the well was there abandoned as a dry hole.

Acknowledgment.—The author wishes to acknowledge the assistance given by many geologists of Wichita. Edward Koester supplied a list of wildcat wells drilled in 1940. Anthony Folger supplied important data on new producing zones and on some of the new pools discovered during the year. Data on total number of wells drilled were provided by Zenas Stuckey. The production figures were supplied by T. A. Morgan and J. H. Page of the State Corporation Commission.

TABLE 1.—*Data on new pools found in 1940.*

COUNTY AND POOL	Location	Discovery well	Potential production, bbls. per day	Producing zone	Depth in feet	Date
Barton County:						
Bird	33–18–15W	Aylward No. 1 Bird	27	Lamotte		April
Hammer	35–19–12W	Carlock No. 1 Hammer	441	Arbuckle	3348–70	August
Prusa Southeast	34–16–11W	Hinkle No. 1 Krautwurst	15	Arbuckle	3394–3402	April
Wondra	15–17–12W	Phillips No. 1 Wondra	100	Lans.-K. C.	3120–25	January
Ellis County:						
Bemis-Shutts West	17–11–17W	Champlin No. 1 Hadley	3,000	Arbuckle		September
Herzog	30–13–16W	Gulf No. 1 Sander	300	Arbuckle	3450–58	June
Ellsworth County						
Stoltenberg Southwest	20–16–10W	Emerich No. 1 Heggy	250	Arbuckle		July
Stoltenberg West	17–16–10W	Elwell No. 1 Adamek		Arbuckle	3365–73	March
Graham County:						
Penokee	11– 8–24W	Shields No. 1 Paxson	220	Lans.-K. C.	3750–56	November
McPherson County:						
Bitikofer	1–20– 1W	Aladdin No. 1 Bitikofer	50	"Chat"	2911–13	May
Coons	13–19– 1W	Carey Drilling No. 1 Coons	3,000	"Chat"	2897–2910	November
Henne	21–17– 1W	Williams No. 1 Henne	M cu. ft. 500	"Chat"	2658–62	November
Phillips County:						
Ray	32– 5–20W	Cities Service No. 1 Ray	2,135	Lamotte	3540–53	August

TABLE 1--*Concluded*

COUNTY AND POOL	Location	Discovery well	Potential production, bbls. per day	Producing zone	Depth in feet	Date
Rice County:						
Karber	7–19–10W	Carlock No. 1 Karber	280	Arbuckle	3343–50	October
Russell County:						
Driscoll	30–15–11W	Hayes No. 1 Driscoll	650	Sooy	3323–	June
Greenvale Northwest	32–14–12W	Magnolia No. 1 Borrell	300	Lans.-K. C.	2956–	November
Lewis	28–14–12W	Jones Shelburne No. 1 Lewis	1,400	"Wabaunsee lime"	2316–29	September
Mahoney	8–14–12W	Jones No. 1 Mahoney	550	Lans.-K. C.	2977–80	June
Davidson Northeast	34–15–11W	Braden McClure No. 1 Phillips	1,250	Gorham		December
Stafford County:						
Bedford	21–23–12W	Shell No. 1 Bean	2,700	Arbuckle	3839–48	August
Riley	28–23–11W	Shell No. 1 Riley	350	Lans.-K. C.	3471–76	August
Roach	12–22–14W	Thayer No. 1 Roach	128	Arbuckle	3747–87	December
Stafford	15–24–12W	Stanolind No. 1 A Charles	3,000	Viola	3836–50	August

TABLE 2.—*Oil and Gas Production by Counties in Western Kansas, in bbls. and M cu. ft., respectively.*

COUNTY		1940	Total	Number of wells
Barber	Oil	125,991	427,920	19
	Gas	7,675,935	44,113,000	34
Barton	Oil	11,647,511 (a)	42,281,621 (a) 27,430,421 (b) 30,972,915 (c)	1,162 (a)
Clark	Oil	17,000	112,650	2
Ellis	Oil	6,484,185	16,804,342	633
Edwards	Gas	33,966	.....	.....
Ellsworth	Oil	3,722,661	14,871,600	294
Finney	Oil	34,000	87,105	2
Graham	Oil	94,300	112,650	7
Harvey	Oil	681,314	19,729,731	135
	Gas	59,960	.....	2
Kingman	Oil	288,470	2,206,003	49
McPherson	Oil	4,008,544	67,350,664	751
	Gas	5,122,903	.....	.....
Ness	Oil	122,200	240,356	13
Pawnee	Oil	41,400	133,162	9
Phillips	Oil	15,400	18,925	7
Pratt	Oil	44,050	87,736	7
	Gas	11,934,153	20,495,515	44
Reno	Oil	3,233,300	35,162,593	496
	Gas	5,145,990	44,000,000	60
Rice	Oil	6,214,330	51,143,745 65,994,922 (e)	853 (d)
	Gas	4,036,273	10,000,000	18
Rooks	Oil	351,098	1,214,075	65
Rush	Oil	291,670	1,442,516	21
	Gas	9,709,900	54,153,900	66
Russell	Oil	12,004,325	68,290,946 (f) 64,658,446 (g)	1,535 (f)
Scott	Oil	152,500	902,462	9
Sedgwick	Oil	1,152,631	39,847,311	228
Stafford	Oil	3,218,360	10,046,498	431
Sumner	Oil	1,042,110	41,425,217	250
Trego	Oil	47,765	402,723	13

(a) Including portion of Silica pool in Rice county.
(b) Excluding Rice county portion of Silica pool.
(c) Including Barton county portion of Trapp pool.
(d) Excluding wells in Rice county portion of Silica pool.
(e) Including production of Rice county portion of Silica pool.
(f) Including the whole Trapp pool, which lies partly in Barton county.
(g) Excluding production of Barton county portion of Trapp pool.

OIL AND GAS DEVELOPMENT IN WESTERN KANSAS COUNTIES

Barber County

The geology of Barber county and the stratigraphy of its producing areas have been described in Mineral Resources Circulars 10 and 13, and in Bulletin 28. To the end of 1940 two gas pools and three oil pools have been found within the county. One of the oil pools is also the main gas pool. The oldest is the Medicine Lodge pool, located 10 miles south of the city of that name. It was discovered in 1927 when the Shaffer Oil Company completed its first well on the Alexander ranch in sec. 13, T. 33 S., R. 13 W. Both oil and gas are produced in this field at the present time.

The second pool to be discovered was the Whelan pool, which lies 3 miles northeast of Medicine Lodge. The first well in the Whelan pool was drilled by the Lario Oil and Gas Company on the Whelan ranch in sec. 32, T. 31 S., R. 11 W. One year later the second gas pool was opened by the Southern and Thurmond Drilling Company well on the Davis ranch, in sec. 13, T. 34 S., R. 15 W. Although the production from this well was very small, it nevertheless indicated the possibilities of the Viola limestone, later partly demonstrated by deep drilling elsewhere in the county. The gas-producing area was named the Aetna gas pool. In July, 1927, the fourth pool was opened by the Pryor and Lockhart No. 1 Gant well, in sec. 7, T. 31 S., R. 13 W. In 1940 an edge well in a possible fifth pool was drilled by the Barbara Oil Company on the farm of E. N. Angell in the SE¼ sec. 10, T. 33 S., R. 14 W., about 4 miles west of the Medicine Lodge pool. The full potentialities of this well have not yet been revealed. Another wildcat well that seemed for a time to have discovered some of the hidden reserves of Barber county was the test well drilled by the Derby Oil Company on the John Hancock farm. This well had excellent shows of oil, but even after it was treated with acid the quantity of oil was not sufficient to make a commercial well. The oil-bearing zone was the Viola limestone.

Lake City Pool.—The Lake City pool, 15 miles northwest of Medicine Lodge, had two wells producing oil at the end of 1940. In an attempt to extend the pool toward the south, Pryor and Lockhart drilled a test well on the Vanderplas ranch in sec. 18, T. 31 S., R. 13 W. All formations to and including the Arbuckle dolomite were

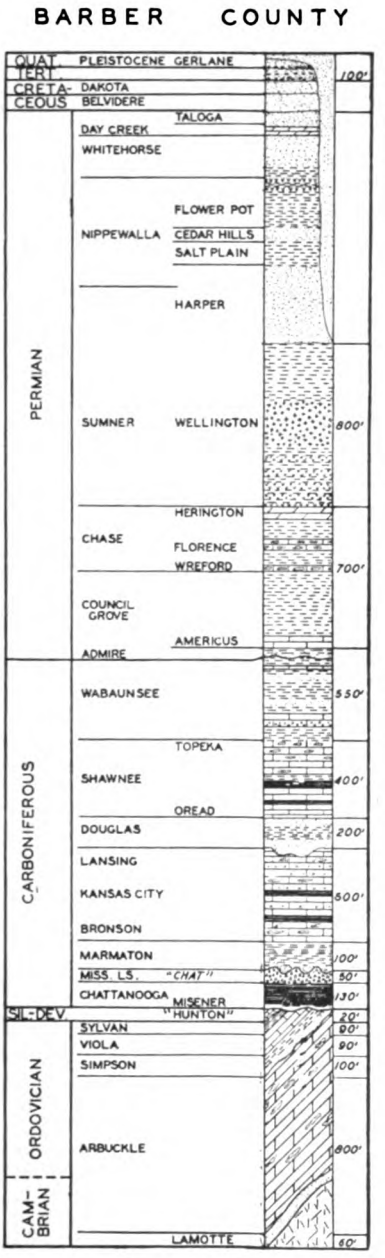

FIG. 2. Columnar section of rocks in Barber county.

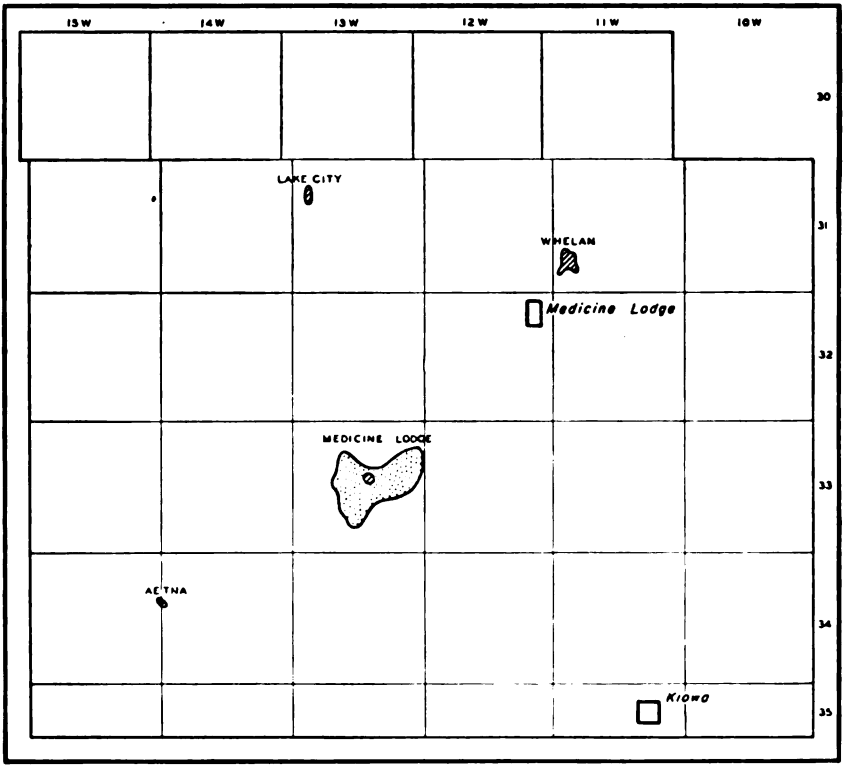

FIG. 3. Map of Barber county showing oil and gas pools. Oblique lines indicate oil pools, dots indicate gas pools.

tested without favorable results. Two miles northwest another test hole was drilled by the Transwestern Oil Company on the Buck ranch in sec. 35, T. 30 S., R. 14 W. This borehole also tested all possible producing strata down to the Arbuckle dolomite, but did not find commercial quantities of oil.

Whelan Pool.—The Whelan pool was the second pool to be discovered in Barber county. In 1940 a drilling campaign in the vicinity of the Whelan pool showed that the whole east half of section 30 and part of the west half of section 29 was likely to be productive. In these two sections six additional oil wells and one gas well were completed. Two of the new wells were given a potential rating of 4,000 barrels per day. This rating will doubtless encourage further drilling in 1941. A dry hole was drilled toward the northeast, setting definite limits to the pool in that direction. Similarly, a dry

hole drilled by the Lario Oil Company in the SW¼ sec. 29 seems to limit the pool in that direction.

Medicine Lodge Gas Pool.—The Medicine Lodge pool produces gas from the Mississippian "chat" and oil from the Misener sand. In 1940 considerable drilling in the vicinity of the pool resulted in the addition of two new gas wells and three dry holes. The new gas wells are located in the SW¼ sec. 9 and they extend the pool in a northerly direction (fig. 4). One dry hole was drilled in the SE¼

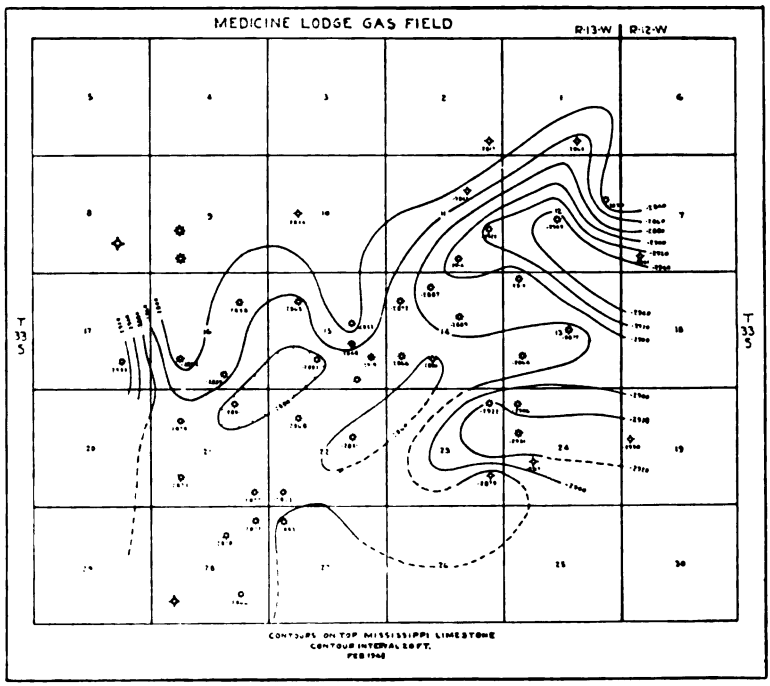

FIG. 4. Contour map of Medicine Lodge gas field. Wells drilled in 1940 are indicated by larger symbols.

sec. 28. An attempt was made by the Sinclair Oil Company to extend the pool 2 miles north. The test was drilled on the Mattie Binning farm in sec. 26, T. 32 S., R. 13 W. It was unsuccessful in finding oil or gas in the zones usually productive in this county and was therefore drilled on down in the hope of finding production in deeper zones. The "Wilcox sand" was found at a depth of 4,857 feet and the Arbuckle dolomite at 4,975 feet, but both were dry. The well was completed at a depth of 5,083 feet, slightly more than 100 feet below the top of the Arbuckle dolomite.

A very interesting wildcat well was drilled by the Barbara Oil Company about 4 miles west of the Medicine Lodge pool. In this well, also, the usual producing zones were dry, but a good flow of oil was obtained from the Viola limestone at a depth of 5,078 feet, about 30 feet below the top of the formation. The possibilities of this well are not yet known.

Oil and Gas Pools of Barber County

Pool and Location	Area acres	Cumulative production to end of 1940, bbls.	Number of wells	Producing zone	Depth in feet
Lake City, 7–31–13W	160	44,150	1	Viola	4.435
			1	Arbuckle	4.607
Medicine Lodge, 15–33–13W	80	43,000	2	Misener	4.845
Whelan, 32–31–11W	1,000	340,800	15	"Chat"	4.355
Medicine Lodge (gas) 13–33–13W	6,400	44,113,080 M cu. ft.	34	"Chat"	4.455

Barton County

At the end of 1940 there were 32 oil pools in Barton county. The oldest of these is the Davidson pool, discovered in March, 1930, by the Prairie Oil Company. The second pool to be discovered was the Isern pool, in the southeastern part of the county. This was later merged with some other pools into the Silica pool, now the second largest in the state. After 1932 other pools were found in rapid succession and these are described in Mineral Resources Circulars 10 and 13, and in Bulletin 28.

Drilling activity in Barton county was very extensive in 1940, there being 252 test wells completed, of which 198 were oil wells. Wildcat drilling resulted in the discovery of four new pools—Bird, Hammer, Prusa Southeast, and Wondra. The older pools are described in the reports mentioned and will not be described in this report unless they received important additions or extensions. The distribution of the pools in Barton county is shown in figure 5.

Beaver Pool.—One new well was added in the Beaver pool, which centers around sec. 17, T. 16 S., R. 12 W. It found oil at a depth of 3,063 to 3,069 feet in a sandstone near the base of the Pennsylvanian system. This well is the Derby No. 1 Stoskopf well, in sec. 21, T. 16 S., R. 12 W.

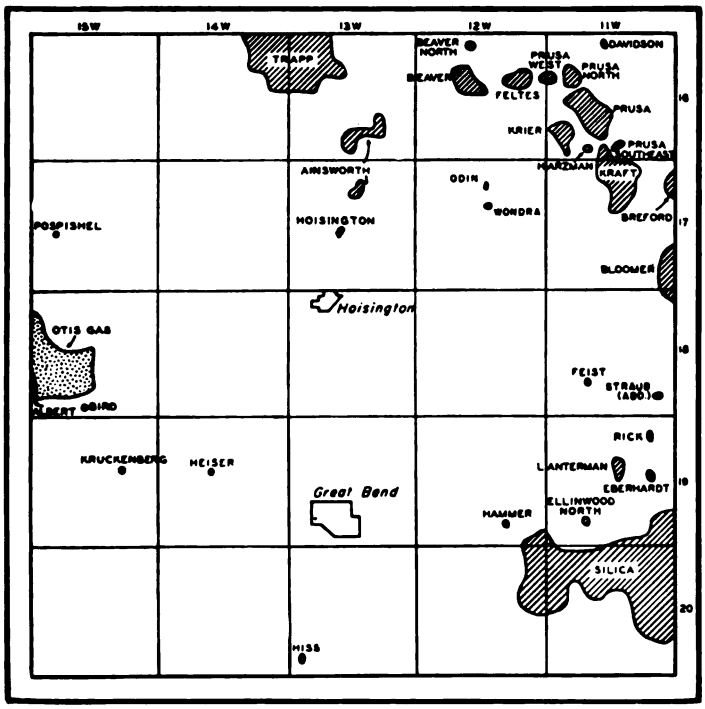

FIG. 5. Map of Barton county showing oil and gas pools. Oblique lines indicate oil pools, dots indicate gas pools.

Bird Pool.—One of the new pools for the year 1940 was opened by the Aylward No. 1 Bird well, in sec. 33, T. 18 S., R. 15 W. Although this well is a small one, it nevertheless indicates possibilities for future extensions, as it produces from the Lamotte sand in an area where it forms a wedge. An examination of the map showing the oil pools of Barton county (fig. 5) reveals the fact that the Bird pool is part of the Otis gas-producing area, and furthermore, is located only 2 miles east of oil production in the Albert pool.

Bloomer Pool.—In the Bloomer pool, which extends into Rice county on the southeast and Ellsworth county on the east, two additional Arbuckle wells and one additional Lansing well were completed. This pool produced a total of 6,711,420 barrels of oil to the end of 1940. A well drilled by Wakefield on the Staatz farm in sec. 23, T. 17 S., R. 11 W., was intended as a test well to explore the area between the Bloomer and the Kraft pools. It was abandoned at a depth of 3,350 feet without finding oil or gas.

Clawson Pool.—In 1940 this pool was joined to the Silica pool.

Feltes Pool.—In 1940 five additional wells were completed in this pool and the producing limits were extended eastward within 1 mile of the Prusa West pool.

Hammer Pool.—In August, 1940, a new pool was opened by Carlock on the Hammer farm. The discovery well was drilled in the NW¼ sec. 35, T. 19 S., R. 12 W. It found the first commercial show of oil at a depth of 3,348 feet, in the Arbuckle dolomite only 1 foot below the top of the formation. The porous zone is 22 feet thick. The oil has a gravity of 41.6° A.P.I., and the initial production of the discovery well was 440 barrels. This new pool lies less than 1 mile west of the large Silica pool and it is not unreasonable to expect that the Hammer pool will be connected with the Silica pool in 1941.

Harzman Pool.—The Harzman pool was discovered in 1939. Inasmuch as it lies between the Kraft pool on the southeast and the Prusa pool to the north, and is less than 1 mile from each, it may not retain an independent listing much longer.

Hoisington Pool.—The Hoisington pool was opened in 1938 by the Thayer and Brauck No. 1 Soderstrom well, in sec. 21, T. 17 S., R. 13 W. Oil was obtained from the Lansing-Kansas City limestone. Two wells drilled later failed to find commercial quantities of oil in this limestone, but were successfully completed in the Arbuckle dolomite. In 1940 an additional well was drilled by McBride in section 21. This well did not produce from the Arbuckle but produced 200 barrels a day when plugged back to the Lansing limestone. The gravity of the oil is 37° A.P.I.

Kraft Pool.—In the Kraft pool 12 oil wells and some dry holes were completed, bringing the number of producing wells to 55. One of the new wells extends the pool eastward nearly a mile to the eastern half of section 2.

Krier Pool.—In 1940 considerable drilling in the vicinity of this pool resulted in some interesting discoveries. In the B. B. & M. Oil Company No. 2 Krier well, in sec. 30, T. 16 S., R. 11 W., oil was found in a porous zone at a depth of 2,345 to 2,354 feet. This zone was later identified as a part of the Topeka limestone, the top of the Shawnee group. In the same section the Brunson well on the Krier "B" lease obtained oil from a porous zone in the Lansing-Kansas City limestone. A third well in the same section, drilled by Springer on the Oeser farm, was completed at a depth of 2,885 feet in a lime-

stone of the Shawnee group somewhat below the Topeka limestone. This is designated as "Shawnee lime" because its exact equivalence to a named sub-division of the Shawnee group is not determined. Finally a fourth producing zone was discovered in the Texas Oil Company No. 1 Janssen well in section 31. This well produces from the Arbuckle limestone at a depth of 3,330 feet. The total number of wells in the Krier pool was 13 at the end of 1940.

Pospishel Pool.—This area received no further test in 1940.

Prusa North Pool.—In 1940 a well in section 17 drilled by Armer on the Ney farm was successfully completed in a new producing zone called by the Nomenclature Committee the "Shawnee lime".

Prusa West Pool.—In 1940 the discovery well was deepened to 3,321 feet and a new potential of 3,000 barrels per day was established. During the year two additional oil wells and three dry holes were completed. One of these, the Solar Oil Company No. 2 Schartz well, was drilled about midway between the Prusa North and the Prusa West pools. Another, the Black and Marshall No. 1 Dolechek, was 0.5 mile south of the Prusa West pool.

Prusa Southeast Pool.—A drilling campaign in T. 16 S., R. 11 W., in 1940 resulted in a series of interesting discoveries. One result was the finding of oil by Hinkle on the Krautwurst farm in section 34. The successful well produces from the Arbuckle dolomite at a depth of 3,394 to 3,402 feet. Although it is only a short distance from the Kraft pool to the south and the main Prusa pool to the west, this pool has been classified as the Prusa Southeast pool. It seems somewhat unfortunate that so many names are used for areas that formerly would have been classified as parts of the same pool. Despite geological diversity it is very likely that all the various Prusa, Krier, and Harzman pools as well as the Feltes pool on the northwest and the Kraft pool on the south are part of the same producing area. It is difficult to find a distance greater than 0.5 mile separating any of these so-called pools. Most of the dry holes that seem to separate them fail to produce because of the unconformity at the base of the Pennsylvanian system.

Silica Pool.—In the Silica pool an extensive drilling campaign resulted in the completion of many additional producing wells, bringing the total to 722 at the end of the year. The Silica pool extends into Rice county, but because the discovery well was drilled in Barton county this large pool is listed under Barton county. In 1940 the whole pool produced 6,548,547 barrels of oil, and the total to the end of the year was 29,685,000 barrels.

Drilling in the Silica pool area has now provided enough data for the geologist to visualize the topography of the eroded top of the Arbuckle dolomite. Seemingly this region was a plateau that had many characteristics of a karst region. ("Karst topography" is a name derived from Dalmatia, in Europe, where calcareous rocks at the surface have been dissolved extensively. It has nothing to do with the Karst pool of southern Russell county, Kansas.) There are local depressions, which seem to represent normal sinkholes due to solution, enlarged in some cases by the collapse of a cavern roof. These depressions are filled with detrital material that is presumed to have been laid down mostly during early Pennsylvanian time. The fill consists of rubble derived from various pre-Pennsylvanian formations. No less than 36 such depressions are now known from drilling records of the Silica pool. Two of them are completely

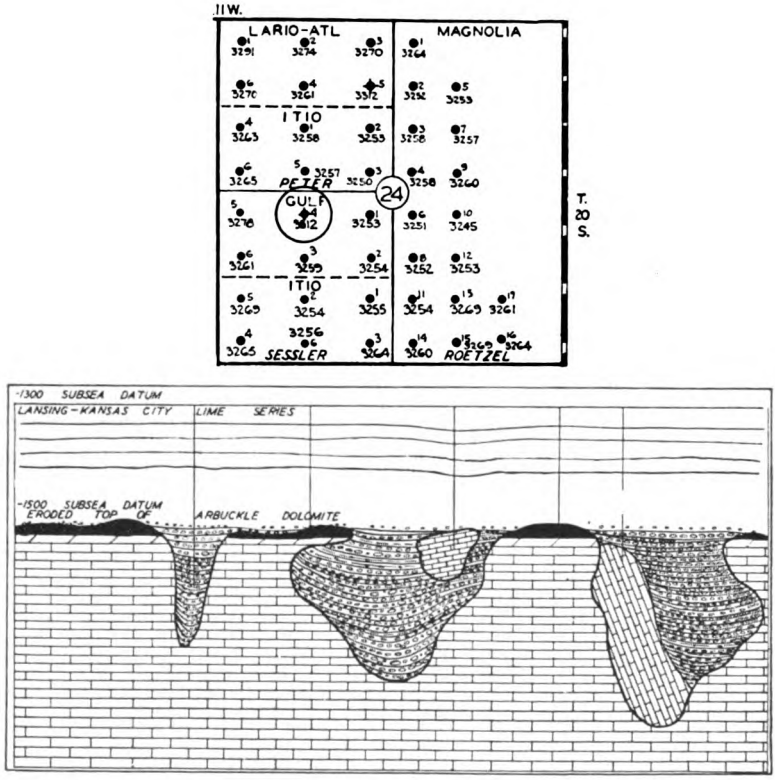

FIG. 6. Map showing location of well, Gulf No. 4 Sessler, drilled into sinkhole, and sketch showing characteristics of such sinkholes. (Reproduced by permission of the *Oil and Gas Journal*.)

surrounded by oil wells and four others are offset by three producing wells. One of the sinks, shown in figure 6, was penetrated in the Gulf Oil Corporation No. 4 Sessler well, which encountered detrital material or conglomerate 40 feet thick. Another hole drilled on the Herter lease by the Stanolind Oil Company in sec. 17, T. 20 S., R. 11 W., was drilled through 137 feet of conglomerate before the Arbuckle dolomite was encountered. Probably the deepest sinkhole was the one penetrated by the Lario Oil Company No. 2 Zahorsky "A" well. In this depression 163 feet of conglomerate was found. A drawing showing the characteristics of such sinkholes is presented in figure 6. It shows how a well penetrating one of these sinkholes might find fresh Arbuckle dolomite in place above a filling of conglomerate.

It is entirely probable that deep ravines that have precipitous side walls dissect the edges of the plateau. Some features of the Silica area suggest such ravines. Very likely no one type of depression accounts for all the low places found in drilling.

In 1940 drilling within the confines of the Silica pool added many wells. Drilling around the fringes resulted in important extensions. A well on the Ernsting farm, in the W½ sec. 6, T. 20 S., R. 11 W., served as an important extension to the west. This well served to link the main pool with an outpost well classified until then as the Ernsting pool, in sec. 1, T. 20 S., R. 12 W., and another outpost well in sec. 36, T. 19 S., R. 12 W., known as the Wolf pool. Now that these two outpost areas are included, the Silica pool reaches into T. 19 S., R. 12 W., and T. 20 S., R. 12 W., and also approaches the Hammer pool. The total area of the Silica pool is now 24,000 acres and it thus becomes the second largest single producing area in the state of Kansas.

Trapp Pool.—Complete statistical details of the pool are included under Russell county. In the Barton county portion, several new wells define the southern and southwestern sides of the pool. Among these the Cities Service No. 2 Stoskopf well, in the SW¼ sec. 17, T. 16 S., R. 13 W., extends the limits of the pool nearly 1 mile southeastward, toward the Ainsworth pool. Toward the southwest, important extension wells were drilled in sec. 11, T. 16 S., R. 14 W., and section 13 of the same township. A dry hole in the northeast corner of section 14 may limit the pool in that direction. A dry hole drilled by Robertson on the Miller farm in sec. 4, T. 16 S., R. 14 W., suggests a definite limit in that direction.

Wondra Pool.—The fourth new pool discovered in Barton county in 1940 is the Wondra pool. It lies 1 mile south of the old Odin

pool, which was abandoned several years ago. The new pool was opened by the Phillips Petroleum Company when its test well in the NE¼ sec. 15, T. 17 S., R. 12 W., found oil at a depth of 3,054 to 3,090 feet in the Lansing-Kansas City limestone. The well had been drilled into the Arbuckle dolomite but no oil was found in that formation.

Dry Holes and Wildcat Wells.—Many dry holes were drilled in Barton county in 1940. Most of the 47 test wells so classified were drilled within 1 mile of a producing area. The 8 wildcat wells that were drilled farther from pools do not provide much new information other than control points for contour mapping. Most of the wildcat wells were drilled by independent operators on "farmouts" from the major companies and by the major companies on acreage on which the leases were about to expire. Two of the wells were drilled in extreme eastern Barton county on account of the proximity of the Stoltenberg pool of Ellsworth county. They were both drilled in sec. 24, T. 16 S., R. 11 W. One of them, the Shell No. 1 Homolka, found an unusually thick section of Pennsylvanian basal conglomerate. An interesting test well was drilled in sec. 7, T. 18 S., R. 11 W., by Carlock on the Jenke farm. The well was drilled to a depth of 3,460 feet, a distance of 43 feet below the top of the Arbuckle dolomite. A rank wildcat well was drilled by W. O. Allen in sec. 3, T. 19 S., R. 13 W., on the Benjamin ranch. It was abandoned as a dry hole at a depth of 3,485 feet. Two holes were drilled about 3 miles west of the Silica pool, one in section 4 and the other in section 9, both in T. 20 S., R. 12 W. They are the Bartlett No. 1 Hulme and the McMorrow No. 1 Tonkin.

Pool and Location	Area, acres	Cumulative production to end of 1940, bbls.	Number of wells	Producing zone	Depth in feet
Ainsworth, 26–16–13W	5,000	1,160,300	56	Arbuckle	3,390
Albert, 30–18–15W	1,200	542,500	14	Lamotte	3,601
Beaver, 16–16–12W	1,000	848,100	3	Oread	2,885
			20	Arbuckle	3,348
			1	Lamotte	3,335
Beaver North, 4–16–12W	160	183,650	3	Arbuckle	3,316
Bird, 33–18–15W	40	2,900	1	Lamotte	3,600
Bloomer, 36–17–11W	3,000	6,711,420	32	Lans.-K. C.	3,044
			1	Sooy	3,310
			166	Arbuckle	3,257
Davidson, 4–16–11W	80	46,500	1	Arbuckle	3,314
Eberhardt, 14–19–11W	160	154,300	4	Arbuckle	3,311
Ellinwood North, 33–19–11W	80	38,500	2	Arbuckle	3,328
Feist, 29–18–11W	40	46,026	1	Arbuckle	3,430
Feltes, 14–16–12W	160	60,215	1	Sooy	3,342
			6	Arbuckle	.....
Hagan, 20–20–11W	40	15,300	1	Arbuckle	3,323
Hammer, 35–19–12W	40	3,450	1	Arbuckle	3,348
Harzman, 33–16–11W	40	2,400	1	Lans.-K. C.	3,124
Heiser, 16–19–14W	40	18,900	1	Lans.-K. C.	3,228
Hiss, 31–20–13W	160	244,800	4	Lans.-K. C.	3,270
Hoisington, 21–17–13W	160	56,900	1	Lans.-K. C.	.....
			2	Arbuckle	3,440
Kraft, 10–17–11W	3,000	956,000	55	Arbuckle	3,281

Oil and Gas Pools of Barton County—Concluded

Pool and Location	Area, acres	Cumulative production to end of 1940, bbls.	Number of wells	Producing zone	Depth in feet
Krier, 30–16–11W	600	84,000	2	Topeka	2,845
			1	"Shawnee"	2,885
			1	Lans.-K. C	.....
			7	Sooy	3,327
			2	Arbuckle	3,330
Kruckenberg, 14–19–15W	160	7,600	1	Lans.-K. C	3,342
			1	Arbuckle	3,580
Lanterman, 15–19–11W	200	209,200	4	Lans.-K. C	3,109
			2	Arbuckle	3,235
Pospishel, 20–17–15W	80	12,000	2	Arbuckle	3,548
Prusa, 20–16–11W	1,800	416,500	1	Topeka	.....
			2	Lans.-K. C	3,160
			28	Arbuckle	3,335
			2	Lamotte	3,310
Prusa North, 18–16–11W	80	45,220	1	"Shawnee"	.....
			2	Lans.-K. C	3,133
			1	Arbuckle	3,328
Prusa Southeast, 34–16–11W	80	3,000	2	Arbuckle	3,394
Prusa West, 18–16–11W	160	15,200	1	Lans.-K. C	3,207
			4	Arbuckle	.....
Rick, 1–19–11W	160	201,400	5	Arbuckle	3,355
Silica, 12–20–11W (a)	24,000	29,685,000	9	Lans.-K. C	2,955
			713	Arbuckle	3,328
Trapp (see Russell county) (b).					
Wondra, 15–17–12W	40	350	1	Lans.-K. C	3,054

(a) Production of Barton county portion of Silica pool 14,833,800.
(b) Production of Barton county portion of Trapp pool, 3,542,494.

Clark County

The history of oil and gas development in Clark county and the areal geology are described briefly in Mineral Resources Circular 10, which summarizes results of drilling to the end of 1937. In 1940 no wells were drilled. The distribution of pools in Clark county is shown in figure 7. A generalized section of the rocks of this county is given in figure 8.

Oil and Gas Pools of Clark County

Pool and Location	Area, acres	Cumulative production to end of 1940, bbls.	Number of wells	Producing zone	Depth in feet
Morrison (oil), 17–32–21W...	160	112,600	2	Viola...	6,467
Morrison (gas), 21–32–21W..	1,000	.....	1	Sooy...	5,443

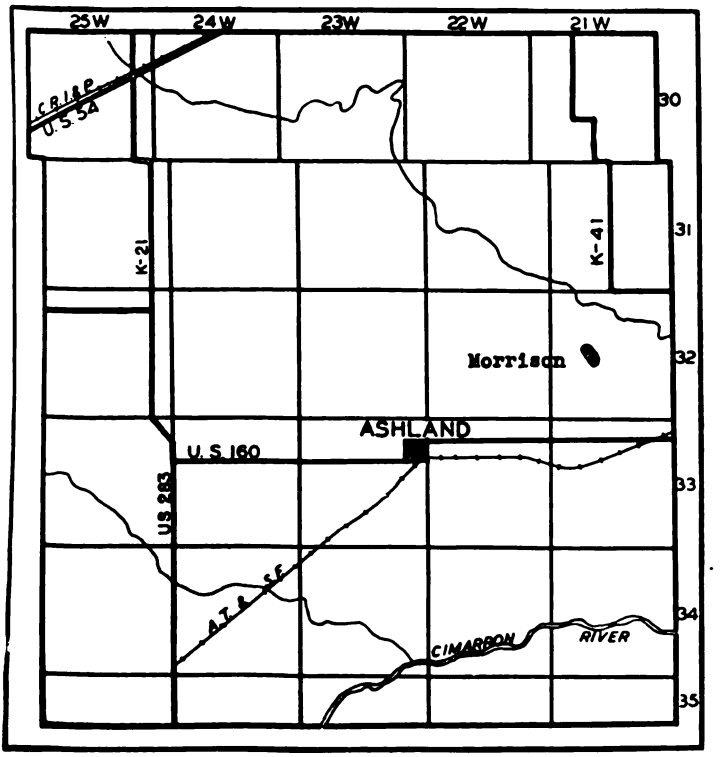

Fig. 7. Map of Clark county showing oil and gas pools.

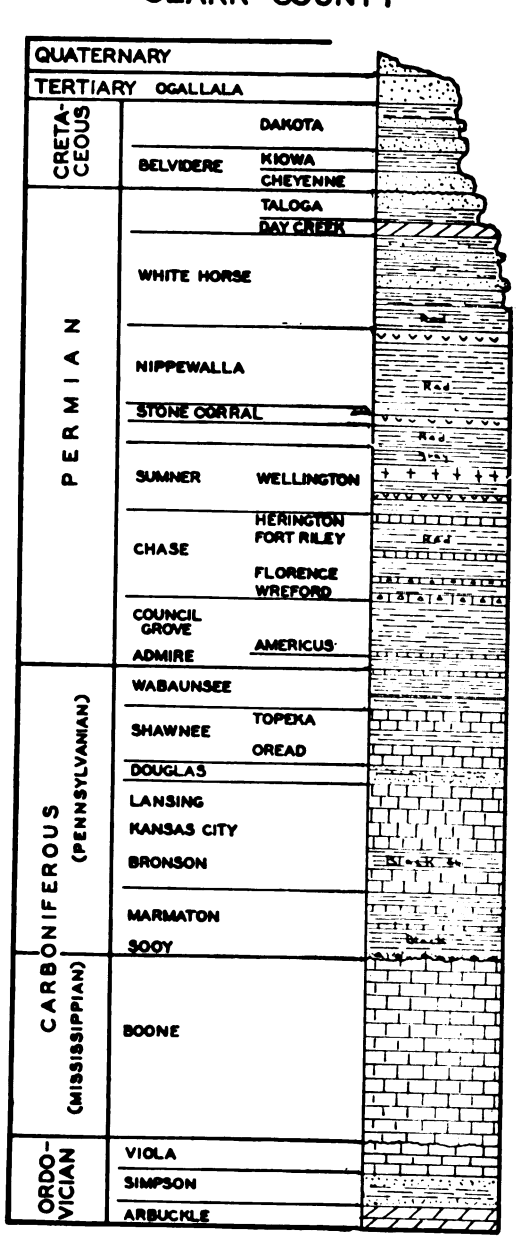

FIG. 8. Columnar section of rocks in Clark county.

Ellis County

One of the areas of most active oil and gas development in 1940 was Ellis county. No fewer than 198 wells were completed, of which 174 were commercial producing wells. Most of the new oil wells were drilled in and near the Bemis and the Burnett pools. In fact, at the end of 1940 it seemed likely that these two pools are part of

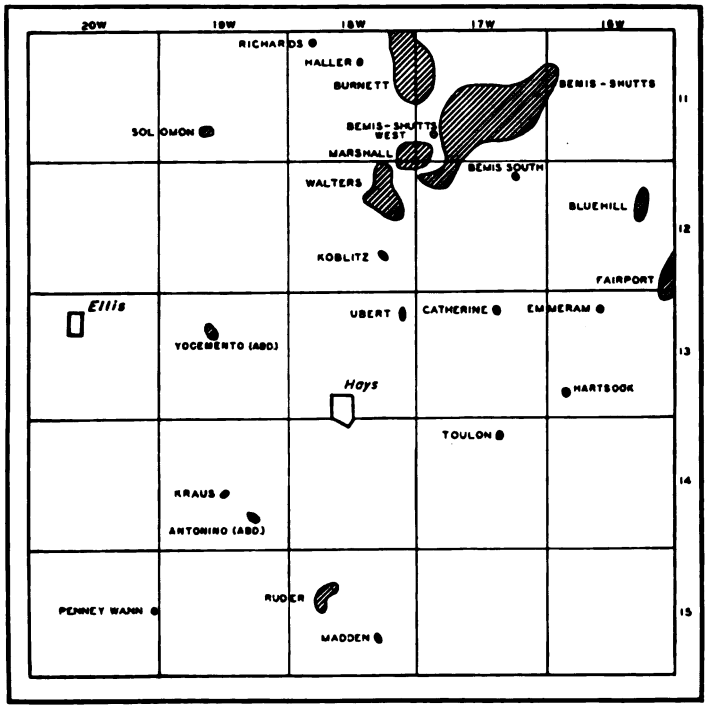

Fig. 9. Map of Ellis county, showing oil pools. (The pool identified as the Hartsook pool is the Herzog pool.)

the same reserve. Furthermore it is likely that the Marshall and Walters pools will also be joined to them before the passing of another year. Most of the 25 dry holes were drilled around the fringes of established pools. Very few were rank wildcat wells. The distribution of oil pools in Ellis county is shown in figure 9, and a generalized section of the rocks of this county is given in figure 10.

Bemis-Shutts Pool.—The Bemis-Shutts pool is the largest in the county, underlying approximately 10,240 acres and including a total of 368 wells. During the year, 70 of the 198 wells drilled in the

ELLIS COUNTY

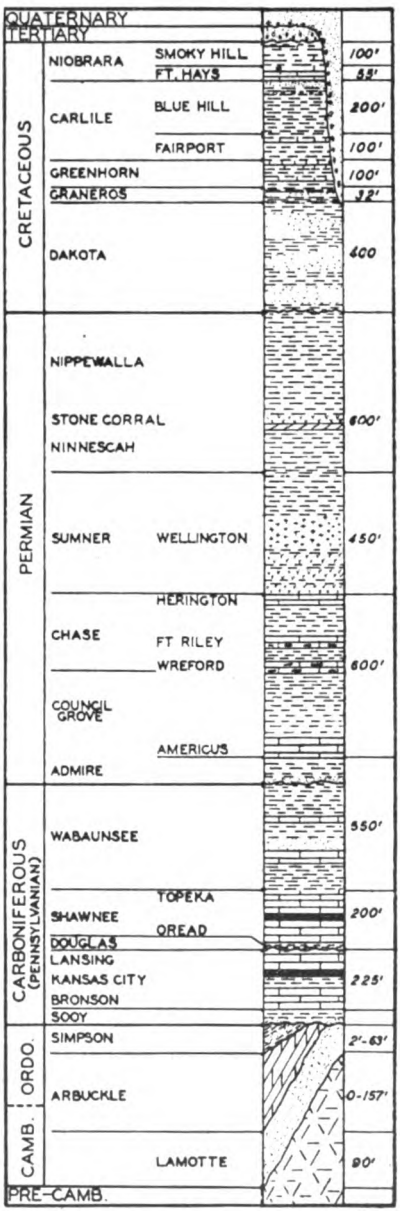

FIG. 10. Columnar section of rocks in Ellis county.

county were drilled in this field. Oil is produced from a porous zone in the Arbuckle dolomite at a depth of approximately 3,400 feet.

An intensive drilling campaign was launched in 1940 in the vicinity of the Bemis-Shutts pool. As a result, new extensions were developed, especially along the east side in sections 23, 24, 25, and 26. The fact that no dry holes were drilled in this portion of the pool indicates that the limits have not yet been found. On the west side of the main pool extensions were also developed in sections 17 and 20, thus enveloping the original Hadley pool. Thus the synclinal (Grand Canyon) area, which seemed to form a barrier in this direction between the Bemis and Burnett pools, seems to have little influence on production, so during the coming year these two pools may be merged. Toward the south an important well in the northern part of section 32 suggests the eventual merging of the Bemis and Marshall pools.

Burnett Pool.—Drilling in the vicinity of the Burnett pool was carried on with great enthusiasm during 1940. In fact, more wells were drilled here than in the Bemis-Shutts pool. The most notable extension was developed in sections 6, 7, and 18 of T. 11 S., R. 17 W. The new wells in the eastern half of section 18 are seperated by less than 1 mile from those in the Bemis-Shutts pool. As there are no dry holes in the intervening area, the probability is great that the two pools will be joined in the near future.

At the end of 1940 the enlarged Burnett pool, including the original Peavey pool, had 138 wells, 2 of which were producing from a porous zone in the Lansing-Kansas City limestone. The cumulative production to the end of 1940 was 2,098,500 barrels.

Haller Pool.—The Haller pool includes only one well, which has produced 13,255 barrels of oil.

Marshall Pool.—The Marshall pool, in the southeastern part of T. 11 S., R. 18 W., produces from the Arbuckle dolomite. Four additional producing wells were completed in 1940.

Richards Pool.—The Richards pool, in the northwestern part of T. 11 S., R. 18 W., was discovered early in 1938. No additional wells were drilled in 1940.

Solomon Pool.—No wells were completed in 1940.

Bluehill Pool.—Eight additional oil wells were completed in the Bluehill pool in 1940. The lack of dry holes in the vicinity of the pool suggests that it may eventually be much larger.

Walters Pool.—An active drilling campaign in 1940 resulted in the completion of 10 new oil wells and 2 dry holes. It is somewhat re-

markable that the potential production of the new oil wells should vary so greatly. The initial potential ranges from that for a minimum well to more than 16,000 barrels. One well came in making 6 percent water. The two dry holes were drilled in the southern half of section 2 and indicate the northern limit of the pool.

Emmeram Pool.—The Emmeram pool, in T. 13 S., R. 16 W., is still a one-well pool. The well was completed in June, 1937, and has produced 36,100 barrels of oil. It produced at the rate of 600 barrels a month during 1940.

Herzog Pool.—The only new pool discovered in 1940 is the Herzog pool, opened by the Gulf Oil Company well on the Sander farm, in the SE¼ sec. 30, T. 13 S., R. 16 W. Initial potential production was 3,000 barrels per day from a porous zone of the Arbuckle dolomite at a depth of 3,458 to 3,465 feet. Later in the year the same company completed a small offset well in section 31. Two dry holes in section 30 make the value of the find problematic.

Catherine Pool.—The Catherine pool was discovered in 1936 and included four wells at the end of 1937. None were added in 1940, but one was abandoned and one was deepened. Harris and Haun deepened their No. 1 Schmeidler in section 3 from 3,362 feet to 3,541 feet. The potential production was 184 barrels per day at the new depth.

Ubert Pool.—The Ubert pool now includes five wells, the last of which was completed in 1940.

Toulon Pool.—No wells were drilled in the Toulon pool in 1940.

Kraus Pool.—No new developments took place in the Kraus pool, in sec. 22, T. 14 S., R. 19 W. Two wells producing from the Pennsylvanian "basal conglomerate" (Sooy formation) have yielded a total of 52,400 barrels of oil since July, 1936.

Madden, Ruder, and Penny Wann Pools.—No producing wells were drilled in 1940 in these pools. The Ruder pool produced a total of 632,600 barrels to the end of 1940. The Penny Wann is still a one-well pool, although it was discovered in September, 1936.

Exploratory Drilling.—Among the dry holes drilled in Ellis county three deserve special mention because they were drilled far from proven areas. One of these was a test well in sec. 36, T. 13 S., R. 17 W., drilled by Gulf on the Arnhold ranch. In this well the Lansing limestone was reached at a depth of 3,258 feet, the Sooy conglomerate at 3,503 feet, and the Arbuckle dolomite at 3,541 feet. The well was abandoned at a depth of 3,604 feet.

The Aladdin Petroleum Company drilled a test well on the Joseph

Pool and Location	Area, acres	Cumulative production to end of 1940, bbls.	Number of wells	Producing zone	Depth in feet
Bemis-Shutts, 16–11–17W	10,240	11,669,425	368	Arbuckle	3,380
Bemis-Shutts West, 20–11–17W	120	37,273	3	Arbuckle	
Bemis South, 2–12–17W	40	17,100	1	Arbuckle	3,592
Blue Hill, 14–12–16W	640	179,500	3	Topeka	
			11	Lans.-K. C.	3,072
			2	Wilcox	3,360
			1	Arbuckle	3,391
Burnett, 1–11–18W	3,600	2,098,500	2	Lans.-K. C.	3,093
			136	Arbuckle	3,570
Catherine, 3–13–17W	160	112,600	4	Lans.-K. C.	3,262
Emmeram, 4–13–16W	40	36,112	1	Lans.-K. C.	3,260
Haller, 10–11–18W	40	13,260	1	Topeka	3,036
Herzog, 30–13–16W	80	6,700	2	Arbuckle	3,450
Koblitz, 23–12–18W	600	44,307	6	Arbuckle	3,694
Madden, 26–15–18W	.....	.....	.....	Lans.-K. C.	3,331
				Arbuckle	3,600
Kraus, 22–14–19W	100	52,400	2	Sooy	3,735
Marshall, 36–11–18W	1,000	467,500	18	Arbuckle	3,638
Penny Wann, 13–15–20W	40	25,900	1	Sooy	3,653
Richards, 5–11–18W	120	66,900	2	Lans.-K. C.	3,332
Ruder, 17–15–18W	700	632,600	12	Lans.-K. C.	3,422
			2	Arbuckle	3,572
Solomon, 28–11–19W	160	48,400	3	Arbuckle	3,629
Toulon, 3–14–17W	200	147,850	3	Lans.-K. C.	3,298
			1	Arbuckle	3,512
Ubert, 12–13–18W	160	123,500	5	Arbuckle	3,707
Walters, 2–12–18W	1,400	987,200	1	Topeka	3,160
			40	Arbuckle	3,619

Kuhn ranch in sec. 17, T. 14 S., R. 16 W., which also explored all possible producing zones down to and including the Arbuckle dolomite. Another rank wildcat was the Central Petroleum Company No. 1 Wellbrock well, in section 32 of the same township. It was abandoned as a dry hole at a depth of 3,451 feet, about 18 feet below the top of the Arbuckle dolomite. In the deep test drilled by the Lion Refining Company in sec. 10, T. 16 S., R. 19 W., the Arbuckle was absent and the top of the Lamotte sand was found at a depth of 3,712 feet.

Ellsworth County

In 1940 there were 172 wells completed in Ellsworth county. Most of these were drilled within or near old pools, so that 143 produced oil and only 29 were dry holes. Most of the drilling was concentrated in the area surrounding the Stoltenberg pool in the western part of the county. The two new pools, Stoltenberg West and Stoltenberg Southwest, were found as a result of this drilling campaign and, as may be surmised, are located nearby. Inasmuch as the geological features (fig. 11) of Ellsworth county were fully described in Mineral Resources Circulars 10 and 13 and Bulletin 28, the following paragraphs will be devoted to a brief summary of developments during 1940. A map showing distribution of oil-productive areas in Ellsworth county is included (fig. 12).

Breford Pool.—The Breford pool, in sec. 7, T. 17 S., R. 10 W., was discovered in September, 1932. The first well produced oil from the Arbuckle dolomite and eventually 14 wells were completed in this zone, but 8 of these were abandoned or plugged back to the Lansing limestone in 1938. The first well to produce from the Lansing limestone was drilled in 1937, and at the end of 1940 there were 10 wells producing from this zone. In 1940 one well producing oil from the Arbuckle dolomite was drilled.

Heiken Pool.—At present only four wells are producing oil.

Lorraine Pool.—No new wells were drilled in the Lorraine pool in 1940, but one well was abandoned, and two others were plugged back to the Lansing-Kansas City zone.

Stoltenberg Pool.—The Stoltenberg pool was opened in 1931 by the Tom Palmer No. 1 Stoltenberg well, in sec. 31, T. 16 S., R. 10 W. By the end of 1939 the pool had 22 producing wells. During 1940 one of the most determined drilling campaigns ever witnessed in Kansas was inaugurated in the vicinity of the pool. In rapid succession outpost wells were completed that led to further exploration. The first of these was the Lauck and Moncrief No. 1 Ehler well, in

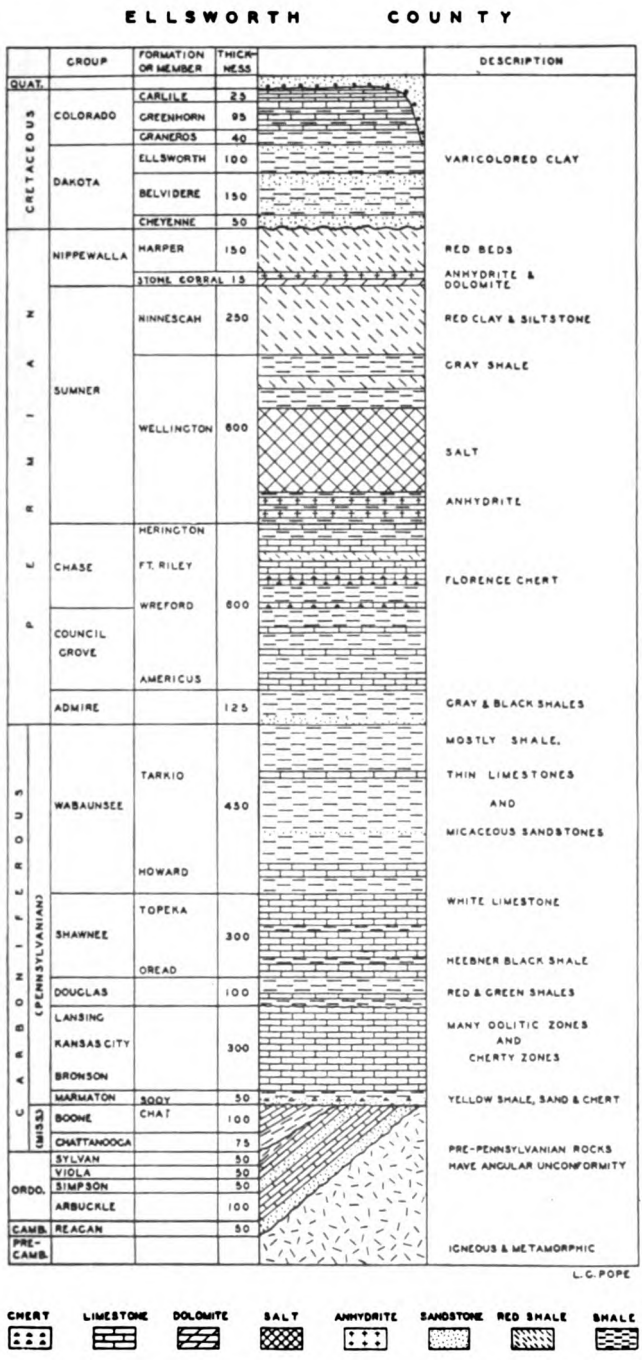

FIG. 11. Columnar section of rocks in Ellsworth county. Drawn by L. G. Pope from data prepared by the author.

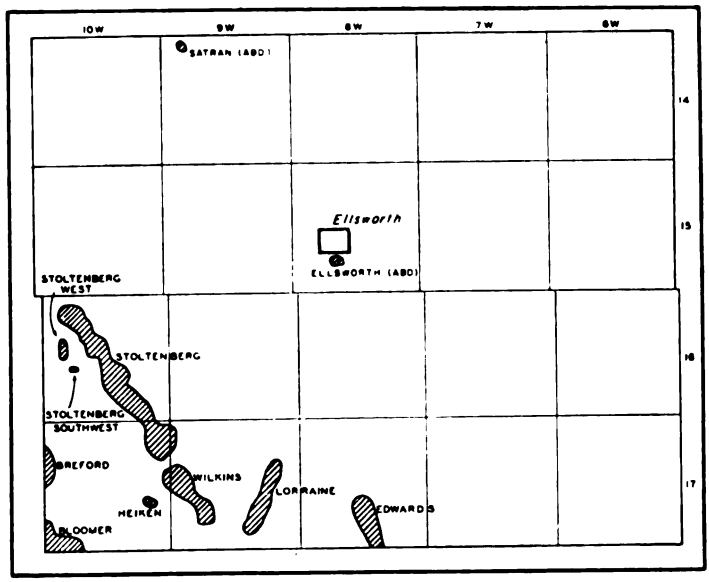

FIG. 12. Map of Ellsworth county showing oil pools.

sec. 35, T. 16 S., R. 10 W., approximately 1.5 miles from the nearest well. Soon afterward, the Stanolind Oil Company completed their test well near the corner of sec. 27, T. 16 S., R. 10 W. This well was located nearly midway between the Ehler well and the old Stoltenberg pool. Very soon enough wells had been drilled nearby to connect the three areas. In the meantime a test well had been started in section 20 about 1 mile southwest of the main pool. This well, the Emerick No. 1 Heggy well, was completed in July and had an initial production of 250 barrels. It opened the area now called the Stoltenberg Southwest pool. Even earlier another outpost well, the Duwe and Farris No. 1 Adamek well, in the W½ section 17, was completed. It was not quite 1 mile from the main pool, and was designated as the discovery well in the Stoltenberg West pool.

The Aylward No. 1 Haska well, in section 6 nearly 2 miles northwest of the main pool, completed at the end of May, was called the discovery well of the Stoltenberg Northwest pool until the last of 1940, when enough intervening locations had been drilled to prove it part of the main pool. At the end of the year the Stoltenberg pool had a total of 133 wells, 111 more than it had at the beginning of the year.

The heavy drilling campaign in the Stoltenberg area was not without its toll of dry holes. Within the pool and one location away

from producing wells, no less than nine dry holes were drilled in 1940. If the wells drilled within 2 miles of the pool are included then the number rises to 16. One of the dry holes at the north end of the pool, Magnolia No. 1 Skaliky in sec. 4, T. 16 S., R. 10 W., found the Simpson at a depth of 3,270 feet and the Arbuckle dolomite at 3,292 feet. This indicates a structural position 77 feet lower than the offset well, which incidentally was structurally the highest well in the pool at that time. One dry hole near the center of section 17 seems at present to separate the main pool from the Stoltenberg West pool, which contains five producing wells. One outpost test well, the Russell Moor No. 1 Lillie in sec. 30, T. 16 S., R. 10 W., found the Arbuckle dolomite low at a depth of 3,371 feet and was abandoned as dry. Another outpost well was drilled by the Atlantic Refining Company on the Novotny farm in section 32. Although the Arbuckle dolomite was fairly high at a depth of 3,292 feet, nevertheless the well was a dry hole. The outpost well of the Magnolia Petroleum Company on the Schroeder farm in section 33 is a small pumping well and thus extends the pool more than 0.5 mile southwest.

Stratman Pool.—In May, 1940, Pryor and Lockhart completed a well near the northeast corner of sec. 1, T. 17 S., R. 10 W., which at the time was about equidistant between the Stratman and Stoltenberg pools, and subsequent drilling has confirmed the fact that these two pools drain the same subsurface reservoir. The name Stratman has therefore been dropped.

Wilkins Pool.—The good results obtained by renewed drilling activity in the Stoltenberg area spread southwestward to the Wilkins pool, and many new wells were added there, extending the limits of the pool in all directions. In all, 24 new oil wells and 3 dry holes were completed. An attempt to connect the Wilkins and the Heiken polls was made by Duwe and Farris, who drilled a well in sec. 15, T. 17 S., R. 10 W. This was unsuccessful. An attempt by the Phillips Company to extend the Wilkins pool to the southwest in section 36 was also unavailing. The pool included 45 wells at the end of 1940.

Bloomer Pool.—The Habiger pool was combined with the Bloomer pool in 1939, and that pool is described under Barton county. In November, 1940, the Stumps pool was joined to the Bloomer pool.

Edwards Pool.—Another pool that was discovered in a different county but that has been extended into Ellsworth county is the Edwards pool. (See Rice county.) Of the 68 wells in the Edwards

pool, 56 are located in Ellsworth county. In 1940, important extensions were made in sections 21 and 22 to the northwest and these indicate that considerable new producing territory will be discovered in that part of the county.

Exploratory Wells.—Except for the activity near the Stoltenberg area, wildcat drilling was at a low ebb in Ellsworth county during 1940. Of the 29 dry holes recorded for the county only 5 others need to be considered. One of these, the Alva Billings No. 1 Vanek, in sec. 25, T. 14 S., R. 10 W., was drilled in the northwesternmost township. It was abandoned as a dry hole at a depth of 3,129 feet without adequately testing all possible producing zones. Another wildcat well in a township without production was the Cities Service No. 1 Kanak well, in sec. 12, T. 16 S., R. 8 W., approximately 5 miles southeast of the city of Ellsworth. It found the Lansing limestone at a depth of 2,501 feet and the Arbuckle dolomite at 2,952 feet. Both were dry and the test was a failure. In the same township the same company drilled a deep well on the Essick farm in section 25. It was plugged and abandoned at a depth of 3,512 feet. In the next adjoining township to the south, T. 17 S., R. 8 W., Duwe and Farris drilled two wells that were intended to extend the Lorraine pool. One was drilled in section 6 and the other in section 18. Both were drilled deep enough to test all likely producing zones.

Oil Pools in Ellsworth County.

Pool and Location	Area, acres	Cumulative production to end of 1940, bbls.	Number of wells	Producing zone	Depth in feet
Breford, 7–17–10W	700	1,140,550	10	Lans.-K. C.	3,140
			9	Arbuckle	3,368
Heiken, 25–17–10W	320	338,500	4	Arbuckle	3,269
Lorraine, 13–17–9W	5,500	7,827,150	25	Lans.-K. C.	3,060
			60	Arbuckle	3,200
Stoltenberg, 21–16–10W	4,800	4,483,122	133	Arbuckle	3,333
Stoltenberg Southwest, 20–16–10W	80	3,870	2	Arbuckle	.....
Stoltenberg West, 17–16–10W	160	7,600	4	Arbuckle	3,365
Stratman joined to Stoltenberg in 1940.					
Wilkins, 13–17–10W	1,800	720,800	45	Arbuckle	3,260

Finney County

Discussion of oil and gas developments in Finney county to the end of 1937 and description of the general geology were included in Mineral Resources Circular 10. Reference was made to the Holcomb gas field, which was discovered in December, 1932. Subsequent drilling of four additional wells brought the total number to

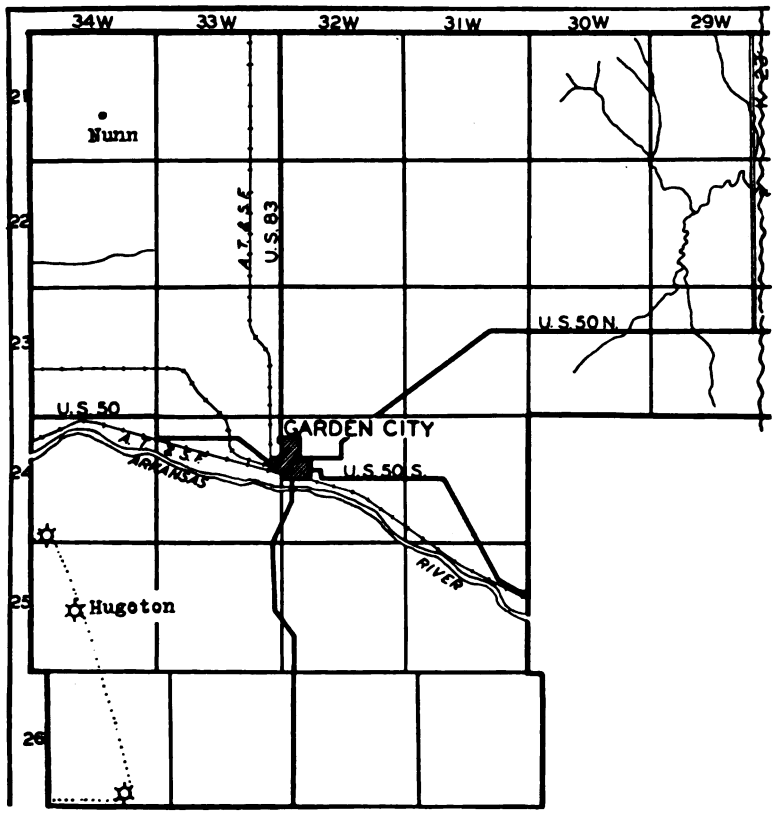

Fig. 13. Map of Finney county showing oil and gas pools.

five, two of which are in Kearny county. In 1938 these wells were incorporated in the Hugoton gas field of southwestern Kansas.

A map showing distribution of oil and gas production in Finney county is given in figure 13.

The gas wells of Finney county are prorated with those of the rest of the Hugoton area. The Brown well, in sec. 16, T. 25 S., R. 34 W., which had an open-flow capacity of 15,504,000 cubic feet per day and a pressure of 425 pounds, had an allowable flow (in

September, 1940) of 14,560,000 cubic feet for the month. The gas is taken by the Northern Natural Gas Company. The Hamlin well, in sec. 31, T. 24 S., R. 34 W., which had an open-flow capacity of 13,600,000 cubic feet per day and a pressure of 427 pounds, had an allowable of 14,266,000 cubic feet for the month of September. The gas is bought by the Tri-County Gas Company. The Jones well, in sec. 34, T. 26 S., R. 34 W., owned by Helmerick and Payne, is not connected with a pipe-line outlet. It has an open-flow capacity of 6,235,000 cubic feet per day and a pressure of 445 pounds. A second well on the Jones ranch was drilled in 1940.

Oil Pool of Finney County

Pool and Location	Area, acres	Cumulative production to end of 1940, bbls.	Number of wells	Producing zone	Depth in feet
Nunn, 27-21-34W....	800	87,100	2	Mississippian..	4,654

Graham County

In 1938 Graham county was added to the list of Kansas counties producing oil, and the geology of the county was described in Bulletin 28.

Morel Pool.—Two wells were drilled by the Continental Oil Company in the vicinity of the Morel pool in 1940. One test on the Desaire ranch in section 10 found the Arbuckle barren at a depth of 3,734 feet. The other, on the Loveridge ranch in section 10, found the Arbuckle dolomite at a depth of 3,671 feet and from a porous zone a few feet lower it produced oil, the potential capacity being 956 barrels per day. There are now 6 wells in this pool and the total production amounts to 112,500 barrels.

Penokee Pool.—In 1940 Graham county was given its second pool. The discovery well was completed in November by R. W. Shields in sec. 11, T. 8 S., R. 24 W., 2 miles north of the town of Penokee. The land on which the well was drilled is owned by Jay Paxson. Although the well was originally intended to test the possibilities of the Arbuckle dolomite found at a depth of 3,965 feet, it was plugged back when the Arbuckle was proved barren. A porous zone in the Lansing-Kansas City limestone at a depth of 3,750 to 3,757 feet was then tested. The well filled 1,000 feet with oil after being washed

in with 500 gallons of hydrochloric acid. The gravity of the oil is 42° A.P.I. When tested for potential capacity by the State Corporation Commission the well was rated at 220 barrels per day.

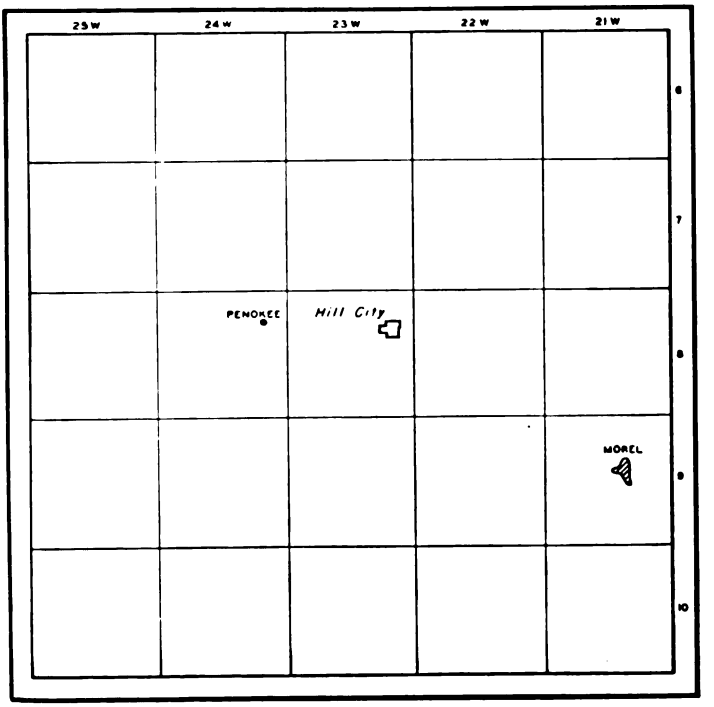

FIG. 14. Map of Graham county showing oil pools.

Oil Pools of Graham County

POOL AND LOCATION	Area, acres	Cumulative production to end of 1940, bbls.	Number of wells	Producing zone	Depth in feet
Morel, 15–9–21W.....	1,200	112,500	6	Arbuckle...	3,718
Penokee, 11–8–24W...	40	150	1	Lans.-K. C.,	3,750

Grant County

Inasmuch as all the wells in Grant county produce from the same strata as those of the Hugoton district, they have been regarded as belonging to the Hugoton gas field, of Stevens county. Therefore, only a few data regarding the drilling activity in Grant county in 1940 are given here.

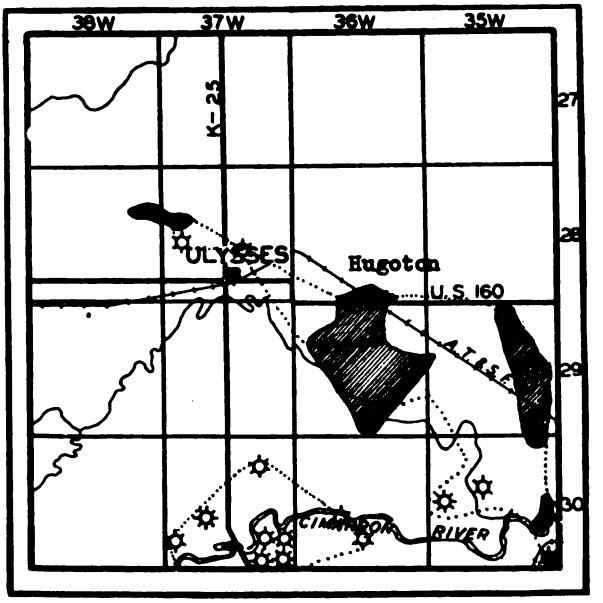

Fig. 15. Map of Grant county showing location of gas wells. Oblique lines indicate gas-producing areas.

Eight gas wells were drilled in the county in 1940. Three of them are located on leases owned and operated by the Panhandle Eastern Pipe Line Company, two on leases of the Columbian Fuel Corporation, and three on leases owned by the United Producing Company. All were very productive, the smallest producing 6,200,000 and the largest almost 23,000,000 cubic feet per day. In 1939 a well capable of producing 40,000,000 cubic feet per day was completed in Grant county. This is the largest gas well every completed within the confines of the large Hugoton area.

Harvey County

The distribution of oil and gas pools in Harvey county is shown in figure 16. Inasmuch as the description of the geological formations in the pools and the early history of the pools are included in Mineral Resources Circulars 10 and 13 and Bulletin 28, only a brief statement will be included here.

Halstead Pool.—At the end of 1940, this pool included a total of 21 wells, and the production had reached a total of 1,176,700 barrels.

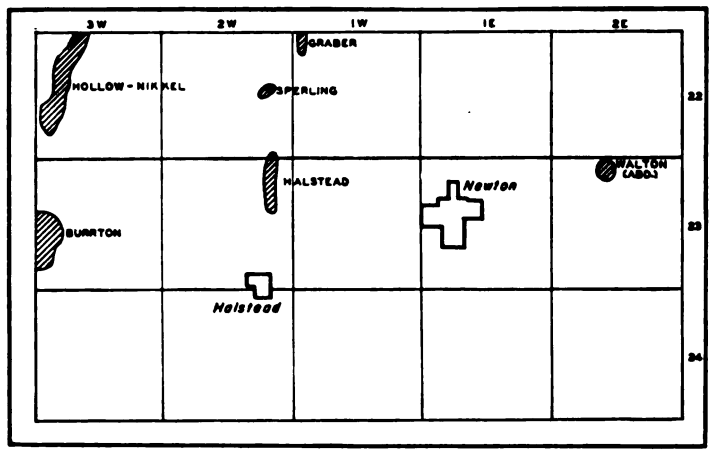

Fig. 16. Map of Harvey county showing oil and gas pools.

Hollow-Nikkel Pool.—No wells were added in 1940, but 3 were abandoned, so that the total number of wells is now 107. In 1940 several wells were deepened in the hope of maintaining production. One of these wells, the Texas Company No. 1 Andrees, in sec. 8, T. 22 S., R. 3 W., was first recompleted at a depth of 3,484 feet and was a small producing well, but in 1940 it was drilled 206 feet deeper without favorable results. The other well is the Magnolia Petroleum Company No. 4 Katie Schmidt well in section 30. It was recompleted at a depth of 3,594 feet, and is producing 100 barrels of oil and 500 barrels of water. To the end of 1940 a total of 18,261,700 barrels of oil had been taken from the pool.

Burrton Pool.—In 1940 there was considerable drilling between the main part of the Burrton pool and the townsite of Burrton. The three successful wells in sections 17 and 19 had a potential production ranging from 490 barrels to 590 barrels per day. Two dry holes

in this part of the field seem to limit further expansion. One of these was drilled in section 8 on the north side of the pool and the other in section 31 on the east side of the pool.

Sperling Pool.—In 1940 no additional wells were drilled in this pool. Furthermore, some of the original gas wells were abandoned.

Oil Pools of Harvey County

Pool and Location	Area, acres	Cumulative production to end of 1940, bbls.	Number of wells	Producing zone	Depth in feet
Halstead 36-22-2W.....	1,200	1,176,700	21	"Chat"....	3,005
Hollow-Nikkel, 30-22-3W	1,500	18,261,700	107	Lans.-K. C., "Chat".... Hunton.... Simpson.... Arbuckle...	2,499 3,195 3,507 3,500 .....
Sperling, 23-22-2W....	500	291,300	7	Hunton....	3,279
Sperling (gas) 23-22-2W.	600	6,158 M cu. ft.	2	Chat.....	2,955

Kearny County

The great Hugoton gas field of southwestern Kansas extends northward into Kearny county. At the end of 1940 there were seven producing wells in the county, all of which were completed in previous years (fig. 17).

One of the most interesting test wells ever drilled in Kansas was completed in Kearny county on August 17, 1940. This well was drilled by the Stanolind Oil Company on a very large block of acreage, which had been "geologized" in every conceivable manner. The well was begun on May 12 and was eventually completed at a total depth of 6,071 feet after testing every possible producing zone. The significant reference levels found in the Judd well are as follows: Dakota sandstone at a depth of 530 feet; Topeka limestone at 3,665 feet; Lansing limestone at 4,060 feet; Mississippian limestone at 4,811 feet; Viola limestone at 5,425 feet; Arbuckle dolomite at 5,555 feet; and pre-Cambrian at 6,065 feet. Good shows of oil were found in the Lansing-Kansas City limestone and also in the Mississippian limestones.

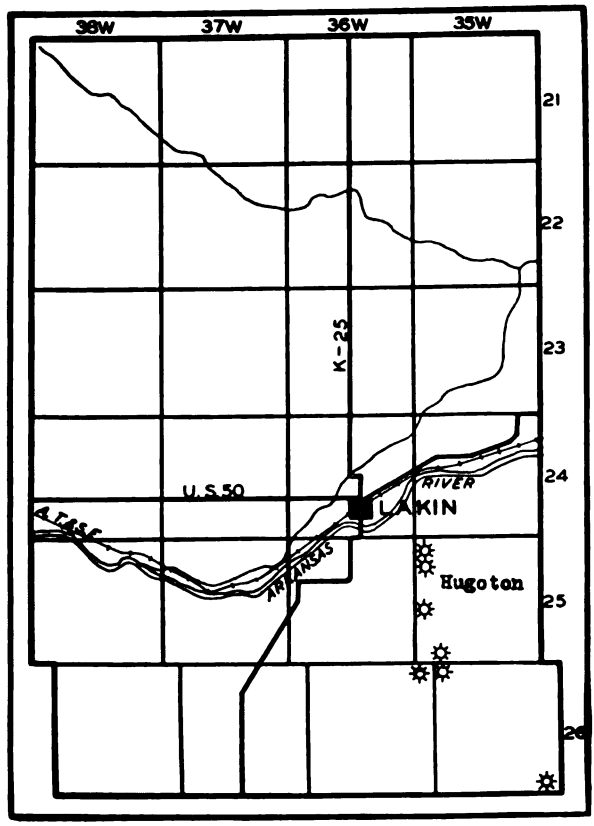

FIG. 17. Map of Kearny county showing location of gas wells.

KINGMAN COUNTY

Drilling activity in Kingman county in 1940 was at a low ebb, as indicated by the fact that only eight wells were completed. Five of these were gas wells in the Cunningham pool, two were combination oil and gas wells in the same pool, and the other one was a dry hole. A map showing pools of Kingman county is given in figure 18.

Cunningham Pool.—In 1940 the Skelly Oil Company, which controls the proved area of the pool, completed five additional gas wells. All these wells produce from the Viola limestone or lower Ordovician levels. One of the wells, the No. 7 A Miles ranch, had a potential production of 125,000,000 cubic feet per day. This large potential production has never been exceeded by any well in Kansas. It should be added that the well was treated with 1,000 gallons of hy-

drochloric acid, which undoubtedly increased the natural flow. The capacity of the well was measured by means of the United States Bureau of Mines back-pressure test. A second well, which had a potential production almost as great, was the No. 9 Ratliffe, which was gauged at 116,000,000 cubic feet after acid treatment.

In addition to these very excellent gas wells the Skelly Gas Company also completed two wells in the Lansing-Kansas City limestone as combination wells. One of these gauged 700 barrels of oil per day and the other 500 barrels. Both produce a small amount of gas with

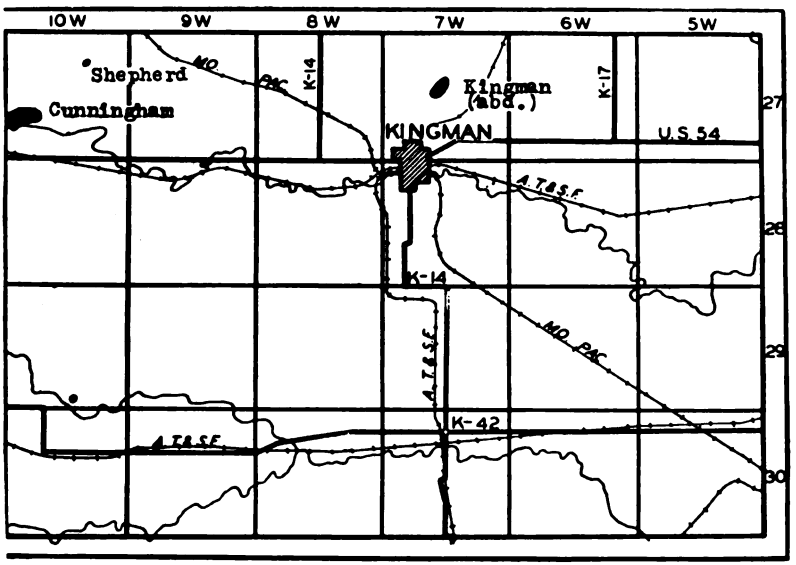

FIG. 18. Map of Kingman county showing oil and gas pools.

the oil. One old Lansing well, the No. 1 D. Miles, was deepened to the Viola and was thereby converted into a large gas well.

This pool extends into Pratt county, and a summary of the drilling in that part of the pool is included in the discussion of Pratt county. To the end of 1940 the production totaled 2,206,000 barrels from 57 wells.

Exploratory Wells.—In addition to the test wells that were successful in finding oil or gas, one dry hole was drilled by W. H. Gaddis several miles northeast of the Cunningham pool, in sec. 11, T. 27 S., R. 10 W. In this well the Lansing limestone was found at a depth of 3,493 feet and the Viola limestone at 4,293 feet. The well was abandoned as a dry hole at a depth of 4,310 feet.

McPherson County

The year 1940 proved to be eventful for McPherson county. Among the 165 wells completed there were 153 oil wells, 1 gas well, and 11 dry holes. Two new oil-producing areas were discovered and one new gas pool was found. The geological sequence in this county was fully described in Mineral Resources Circular 10. The older oil pools and their history were discussed in Bulletin 28. Therefore only significant data pertaining to 1940 will be presented in the following account. A map of the pools in this county appears in figure 19.

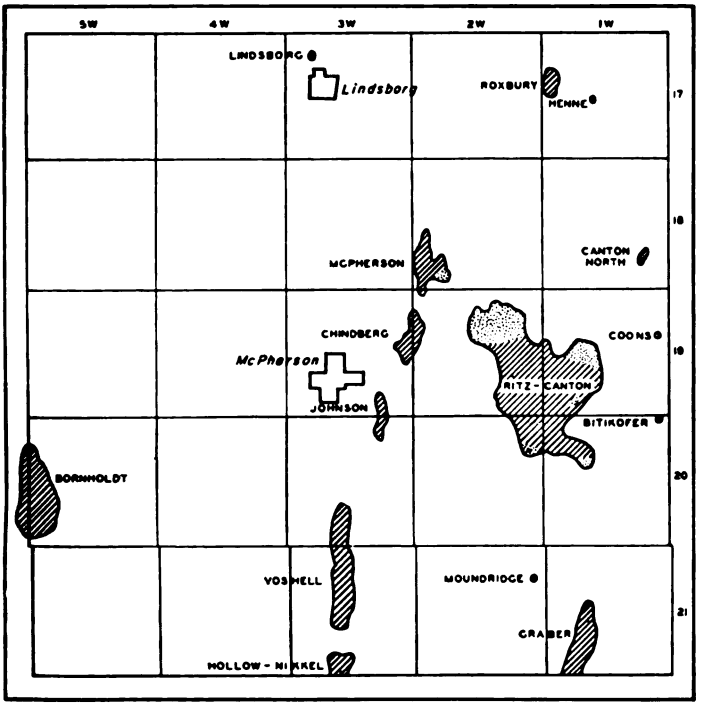

FIG. 19. Map of McPherson county showing oil and gas pools. Oblique lines indicate oil pools, dots indicate gas pools.

McPherson Pool.—In 1940 only one well was added in this pool. It is the H. and M. Drilling Company No. 1 Nordling well, in sec. 19, T. 18 S., R. 2 W. At the beginning of 1940 there were 28 wells deriving their production from the Mississippian "chat". The total production to that time was slightly more than 867,000 barrels.

Johnson Pool.—No additional producing wells were drilled in 1940. To the end of 1940 this pool had produced 2,538,000 barrels of oil.

Voshell Pool.—At the beginning of 1940 the field had a total of 105 wells. This number was reduced to 93 by the end of the year. No new producing wells were drilled. The Sinclair Oil Company deepened its No. 8 Morehouse from 3,392 feet to 4,430 feet, and converted it into a water-disposal well. Production for the year was 556,782 barrels, bringing the total almost to 23,000,000 barrels.

Ritz-Canton Pool.—The completion of seven new "chat" wells in 1940 brought the total number of wells at the end of the year to 271. In addition one new gas well was completed. Four old wells were deepened to a lower zone in the Mississippian and recompleted as oil wells of various potential production. The producing area now exceeds 13,000 acres and the total oil production to the end of 1940 exceeds 33,000,000 barrels.

Graber Pool.—Ranking third in activity in McPherson county in 1940 was the Graber pool, discovered in June, 1937. The six wells completed in the Hunton formation in 1940 increased the total to 125. This pool produced nearly 1,000,000 barrels of oil in 1940 and the cumulative total to the end of the year was 5,035,300 barrels.

Lindsborg Pool.—No additional wells were drilled in 1940.

Roxbury Pool.—Twenty-one additional producing wells and one dry hole were drilled in 1940. The potential capacity of the producing wells ranges from 350 barrels to 2,300 barrels per day.

Bornholdt Pool.—By far the most active pool during 1940 was the Bornholdt pool, which lies along the west side of the county in R. 5 W.

In 1940 the drilling campaign that was started in 1939 continued with enthusiasm, and 127 wells were completed. In April the Republic Natural Gas Company drilled a well that connected the Bornholdt and the Bornholdt North pools. The latter name is therefore abandoned. The enlarged pool was greatly extended northward into section 7 and eastward into sections 20, 29, and 32. One dry hole in the NE¼ sec. 29 seems to limit the pool in that direction. On the west side of the pool 17 wells were drilled. Of these, 15 were completed as oil wells and 2 as dry holes. One of them, the Continental No. 1 "A" Mattson well, in sec. 25, T. 20 S., R. 6 W., was drilled to a total depth of 3,964 feet and is being used as a water-disposal well.

New Pools.—In 1940, three new areas were found to be productive of oil or gas in McPherson county. The new pools are the Bitikofer, the Coons, and the Henne pools. They are all situated in the eastern tier of townships.

Pool and Location	Area, acres	Cumulative production to end of 1940, bbls.	Number of wells	Producing zone	Depth in feet
Bitikofer, 1–20–1W	40	1,160	1	"Chat"	2,885
Bornholdt, 30–20–5W	2,400	907,400	143	"Chat"	3,292
Canton North, 26–18–1W	40	58,200	1	"Chat"	2,803
Chindberg, 18–19–2W	700	1,223,500	6	Lans.-K. C.	2,363
			25	"Chat"	3,007
Graber, 32–21–1W	2,800	5,035,300	3	"Chat"	
			2	Misener	3,323
			125	Hunton	3,274
			1	Simpson	3,398
Henne, 21–17–1W	40		1	"Chat"	2,658
Johnson, 35–19–3W	1,200	2,538,100	16	"Chat"	3,032
Lindsborg, 8–17–3W	160	47,350	2	Viola	3,352
McPherson, 29–18–2W	2,000	867,500	28	Lans.-K. C.	2,340
				"Chat"	2,967
				Viola	3,140
Ritz-Canton, 1–21–2W	13,000	33,550,400	271	Lans.-K. C.	2,360
				"Chat"	2,935
				Viola	3,412
				Simpson	3,440
Roxbury, 18–17–1W	250	178,850	28	"Chat"	2,684
Voshell, 9–21–3W	3,500	22,941,850	93	"Chat"	3,095
				Viola	3,301
				Simpson	3,322
				Arbuckle	3,394
Coons (gas) 13–19–1W	40		1	"Chat"	2,897
Moundridge (gas)12–21–2W	40		1	"Chat"	3,007

Bitikofer Pool.—The Bitikofer pool was opened by the Aladdin Petroleum Company well on the Bitikofer farm in sec. 1, T. 20 S., R. 1 W. The top of the Mississippian "chat" was found at a depth of 2,885 feet, and when the well was drilled 26 feet lower, oil entered the hole. The porous zone was penetrated 2 feet and the well was completed as a 50-barrel well. Considerable gas was found at a depth of 2,888 to 2,907 feet. The gravity of the oil is 29° A.P.I. An offset well drilled by the Aladdin Company on the Sarah Young farm, in sec. 36, T. 19 S., R. 1 W., failed to produce oil and was abandoned at a depth of 3,366 feet. The well tested the Viola limestone, which was barren.

Henne Pool.—Late in November, 1940, the test well being drilled by Williams and Morine on the Henne farm, in sec. 21, T. 17 S., R. 1 W., encountered a porous zone in the Mississippian "chat" at a depth of 2,658 to 2,662 feet. This porous zone was 10 feet below the top of the formation and was later proved to have a potential capacity of 495 barrels per day. The new pool is located more than 1.5 miles from the nearest outpost well in the Roxbury pool, and 0.25 mile from the townsite of Roxbury.

Coons Pool.—A new gas pool was discovered in 1940 on the Coons farm, in sec. 13, T. 19 S., R. 1 W., by the Cary Drilling Company. The gas comes from a porous zone in the Mississippian limestone at a depth of 2,897 to 2,910 feet. The initial production of 3,000,000 cubic feet per day augurs well for the future development of this area.

Exploratory Drilling.—Most of the 11 dry holes drilled in McPherson county in 1940 were in territory adjacent to producing wells, but at least two were rank wildcats, inasmuch as they were drilled more than 2 miles from any pool. The Westgate Greenland Oil Company tested an area 6 miles from any producing oil well, in sec. 18, T. 13 S., R. 1 W. The Mississippian limestone was found at a depth of 2,763 feet and the total depth is 2,855 feet. Thus the deeper levels that might be productive remain untested.

A very interesting wildcat well was drilled in the northwestern part of the county by the H. and M. Drilling Company. It is located on the Swenson farm in sec. 9, T. 18 S., R. 4 W. The Mississippian limestone was found at a depth of 3,021 feet and the Arbuckle dolomite at 3,505 feet. Unfortunately all possible producing zones were barren and the test was abandoned at a depth of 3,615 feet.

A well intended to explore the area between the Ritz-Canton pool

and the Moundridge gas pool was completed by the Progressive Oil Company in sec. 26, T. 20 S., R. 2 W. The Mississippian limestone, found at a depth of 2,973 feet, was dry, and the well was abandoned at 3,025 feet.

Ness County

The general geology and the oil discoveries of Ness county were described in Mineral Resources Circulars 10 and 13 and in Bulletin 28. At present the only oil pool is the Aldrich pool, in the western

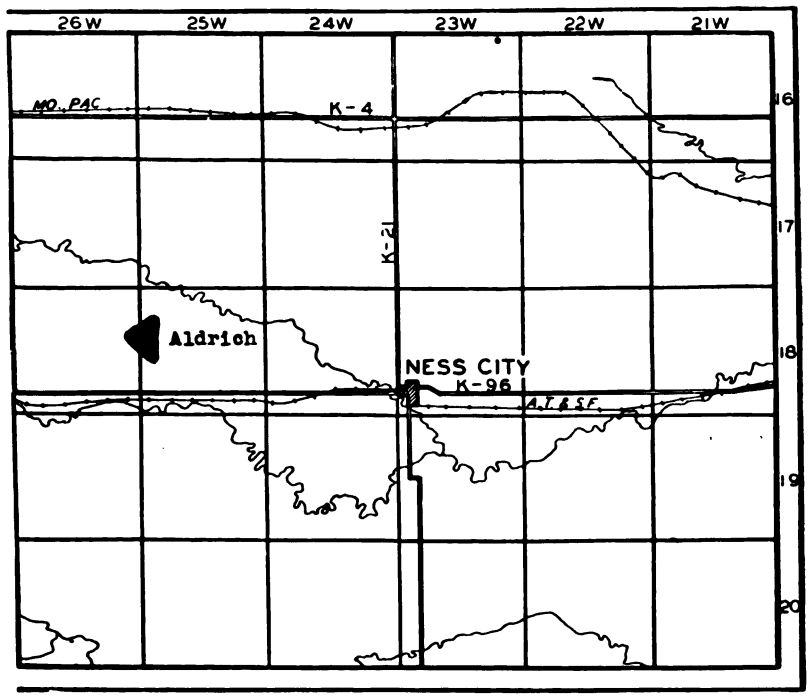

Fig. 20. Map of Ness county showing location of Aldrich pool.

part of the county, 12 miles west of Ness City (fig. 20). In 1940 two producing wells were drilled so that the total number of wells is now 13. Production to the end of 1940 totaled 240,350 barrels.

Only one test well was drilled in Ness county in 1940. It was drilled by the Aladdin Petroleum Company on the Jedlicka farm, in sec. 33, T. 20 S., R. 23 W., about 10 miles south of Ness City. The Mississippian limestone, which produces oil in the Aldrich pool, was found at a depth of 4,348 feet, but was barren. The well was drilled deeper and reached the Viola limestone at a depth of 4,539

feet, the Simpson formation at 4,762 feet, and the Arbuckle dolomite at 4,810 feet. The total depth is 4,872 feet. The well was abandoned on December 21, 1940.

Oil Pool of Ness County

Pool and Location	Area, acres	Cumulative production to end of 1940, bbls.	Number of wells	Producing zone	Depth in feet
Aldrich, 7–18–25W..	2,000	240,350	13	Fort Scott.....	4,378
				Mississippi lime..	4,428

Pawnee County

The Pawnee Rock pool, the only oil pool in Pawnee county, was discovered in September, 1936. In 1940 three wells were added, bringing the total to nine. The new wells are all on the Nellie Belt

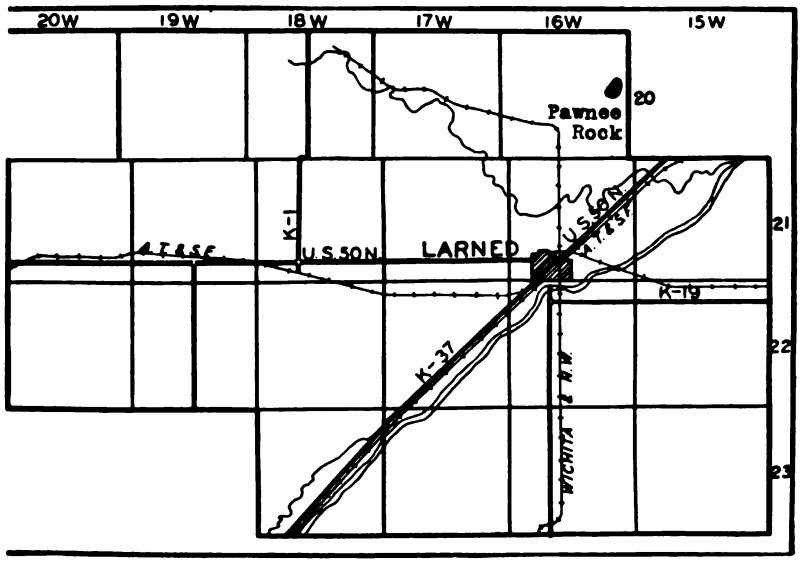

Fig. 21. Map of Pawnee county showing location of Pawnee Rock pool.

ranch in sec. 13, T. 20 S., R. 16 W. The initial potential production ranges from 66 barrels in the smallest to 1,400 barrels in the largest well. The production from this pool to the end of 1940 was 133,150 barrels.

Exploratory drilling in Pawnee county in 1940 was limited to two test wells. One of these was drilled about 6 miles south of the Pawnee Rock pool, in sec. 12, T. 21 S., R. 16 W. In this well, drilled by the Magnolia Petroleum Company on the Smith ranch, the Viola limestone was reached at a depth of 3,694 feet, the Simpson at 3,722 feet, and the Arbuckle dolomite at 3,764 feet. At a total depth of 3,787 feet the well was abandoned.

The second wildcat well was drilled about 6 miles still farther south, in sec. 21, T. 22 S., R. 16 W. It was drilled by the Derby Oil Company on the Gilkison ranch. The Simpson formation was reached at a depth of 4,083 feet and the Arbuckle dolomite 22 feet lower.

For information on the geology and structure of Pawnee county the reader is referred to Mineral Recources Circular 10, published in 1938.

Oil Pool of Pawnee County

Pool and Location	Area, acres	Cumulative production to end of 1940, bbls.	Number of wells	Producing zone	Depth in feet
Pawnee Rock, 13-20-16W	800	133,150	9	Arbuckle...	3,825

Phillips County

In 1939 Phillips county was added to the ever-lengthening list of oil-producing counties. The geology of the county was described in Bulletin 28.

Bow Creek Pool.—The first oil well in Phillips county was completed in May, 1939. In 1940 this well produced 7,400 barrels of oil.

Ray Pool.—In 1940 a second Phillips county oil pool was discovered by the Cities Service Oil Company. The discovery well was drilled on the Ray farm in sec. 32, T. 5 S., R. 20 W. It was completed on July 7, 1940, after having been plugged back from the pre-Cambrian granite. The producing zone lies in the Lamotte sand, sometimes also called the Reagan or "Basal" sand. The sand was reached at a depth of 3,540 feet. The porous zone extended from 3,540 to 3,553 feet, and the initial potential rating given the discovery well was 2,135 barrels. Gravity of the oil is 34° A. P. I. Before the end of 1940 the Cities Service Oil Company completed four additional producing wells and the Cetal Oil Company drilled one.

Exploratory Wells.—Three dry holes were drilled in Phillips county in 1940. One of these was the Hess and Son No. 2 Donaldson well, drilled near the Bow Creek pool. It was abandoned at a depth of 3,165 feet. An interesting test well was drilled by the Gulf Oil Corporation on the Boughton ranch in sec. 10, T. 4 S., R. 19 W.

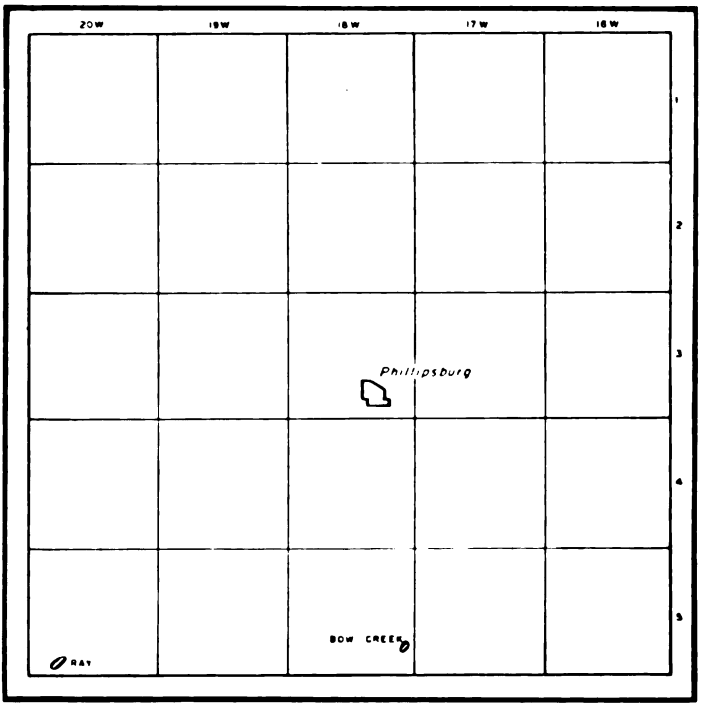

FIG. 22. Map of Phillips county showing oil pools.

This well also failed to find commercial production in the usual producing levels so was abandoned at a depth of 3,375 feet, or 49 feet below the top of the Arbuckle dolomite. At the end of the year the Cetal Oil Company was completing an interesting well in Graham county on the Hixenbaugh farm just south of the new Ray pool. This well failed to find any Arbuckle dolomite or Lamotte sand. It was drilled into porous and saturated granite wash at a depth of 3,529 feet. Tests made later proved that the amount of oil was not sufficient to make a profitable oil well.

Oil Pools of Phillips County

Pool and Location	Area, acres	Cumulative production to end of 1940, bbls.	Number of wells	Producing zone	Depth in feet
Bow Creek, 25-5-18W...	40	10,900	1	Lans.-K. C.,	3,111
Ray, 32-5-20W.....	300	8,000	6	Lamotte....	3,540

Pratt County

Drilling was fairly active in Pratt county in 1940 and was fairly well distributed over the county. Among the 24 completed wells there were 12 oil wells, 8 gas wells, and 4 dry holes. The pools and the stratigraphy in the pools have been described in Mineral Resources Circulars 10 and 13 and Bulletin 28. At present there are two oil pools and one gas pool in the county (fig. 23).

Cunningham Pool.—The most important producing area is the Cunningham Pool, which lies mostly in Kingman county, but extends into Pratt county. Seven additional wells were drilled in the Pratt

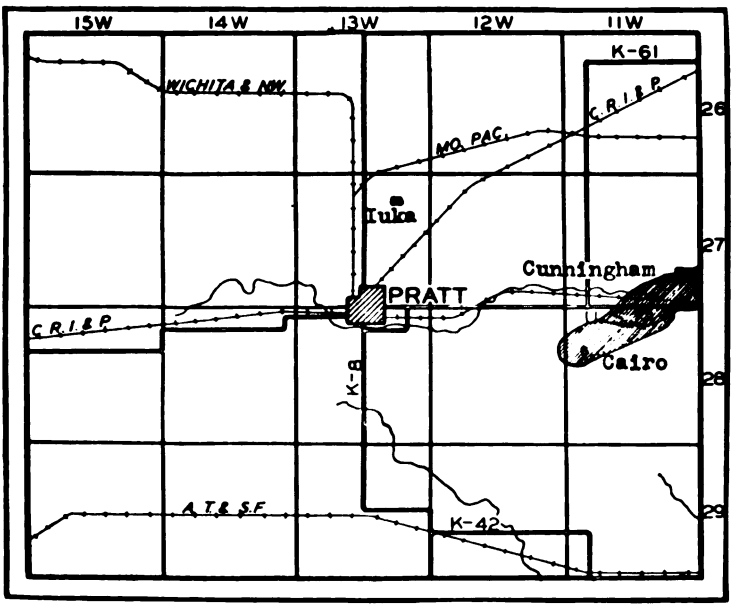

Fig. 23. Map of Pratt county showing oil and gas pools.

county portion of this pool by the Skelly Oil Company. Five were completed in section 25 and these have a potential production ranging from 500 to 700 barrels of oil. The oil is accompanied by small amounts of gas. Two wells were completed in section 36 and these have about the same capacity as those completed in section 25. One dry hole was drilled in sec. 24, T. 27 S., R. 11 W.

Iuka Pool.—In 1940 two oil wells were completed that produce from the Simpson dolomite, and another well was completed that gives this pool a second producing zone, the Arbuckle dolomite. This last well, the Skelly No. 1 Helmke well, in sec. 1, T. 27 S., R. 13 W., was completed in December, 1940. The Arbuckle was reached at a depth of 4,354 feet and the porous zone extended to 4,367 feet. The initial potential production of 1,572 barrels will doubtless encourage further testing of this zone. One dry hole drilled by Marlyn Oil Company in the NW¼ sec. 1 limits the pool in a northerly direction.

Another dry hole was completed about 1 mile southeast of the present limits of the Iuka pool. It is the No. 1 Montgomery well in section 13. In this well the Viola limestone was found at a depth of 4,278 feet, the Simpson shale at 4,321 feet, and the Simpson sand (or "Wilcox") at 4,330 feet.

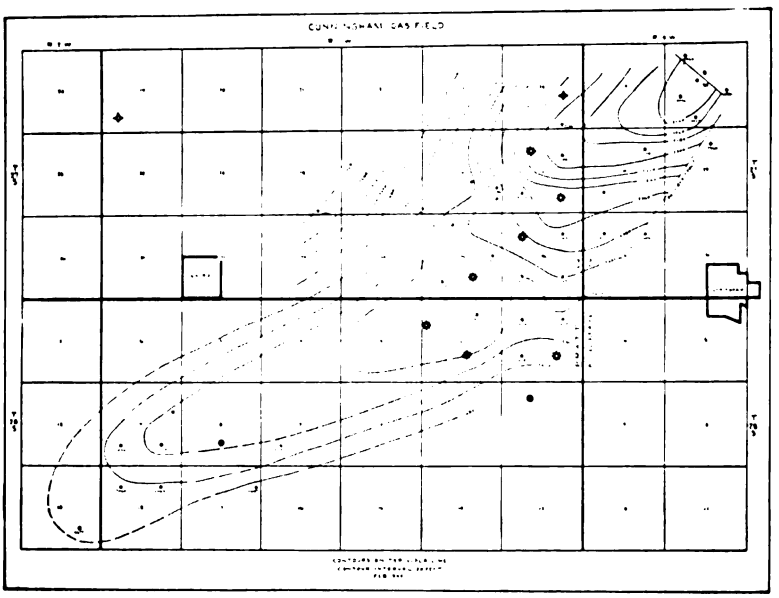

FIG. 24. Contour map of Cunningham and Cairo gas field. Wells drilled in 1940 are indicated by larger symbols.

Cairo Pool.—In 1940, nine more good gas wells were completed in the Cairo pool. Production ranges from 14,000,000 to 70,000,000 cubic feet per day. The open-flow capacity of the gas wells in the Cairo pool amounted to approximately 2,000,000,000 cubic feet at the beginning of 1941. The average well pressure at that time was 1,170 pounds and the pressure over the whole field was almost uniform.

One additional oil well was completed in the southwestern part of the pool, the Skelly Oil Company No. 1 Goyen well, in sec 8, T. 28 S., R. 11 W. A second oil well, the status of which is uncertain at present, was drilled by the Springrose Oil Company along the south line of the Cairo pool in sec. 12, T. 28 S., R. 11 W. Inasmuch as the well had a potential capacity of 27,500 barrels, it may conceivably cause a drilling campaign of large proportions (fig. 24).

At the present time there is no line of division between the Cunningham pool and the Cairo pool, but inasmuch as the former produces chiefly from the Lansing limestone and the latter from the Viola limestone, they are still listed separately.

Oil and Gas Pools of Pratt County

Pool and Location	Area, acres	Cumulative production to end of 1940, bbls.	Number of wells	Producing zone	Depth in feet
Cairo, 7-28-11W.....	160	9,500	4	Viola.....	4,267
Iuka, 11-27-13W.....	200	78,300	2	Simpson....	4,292
			1	Arbuckle...	4,354
Cairo (gas) 7-28-11W..	12,000	20,459,515 M cu. ft.	44	Viola.....	4,278

Exploratory Wells.—One very interesting wildcat well that was drilled in Pratt county in 1940 reveals some valuable geological data in a part of the county considerably removed from former test wells. It is the Cities Service Oil Company No. 1 Lahrling well, in sec. 19, T. 27 S., R. 11 W. The Pennsylvanian Lansing limestone was found at a depth of 3,660 feet and the Mississippian limestone at 4,107 feet. The possible producing zone, the Viola, was entered at 4,317 feet and was barren. The Simpson formation was encountered at 4,391 feet and the Arbuckle dolomite at 4,513 feet. The well was drilled to a total depth of 4,529 feet and was then plugged back to 4,387 feet to test a good showing of oil and gas. The quantity of these fluids was insufficient, so the well was abandoned.

Reno County

Drilling activity in Reno county was somewhat subdued in 1940, inasmuch as only 25 wells were completed. Considerable drilling in old established pools resulted in 22 additional oil wells, and only 3 dry holes. The distribution of oil and gas pools in Reno county is shown in figure 25.

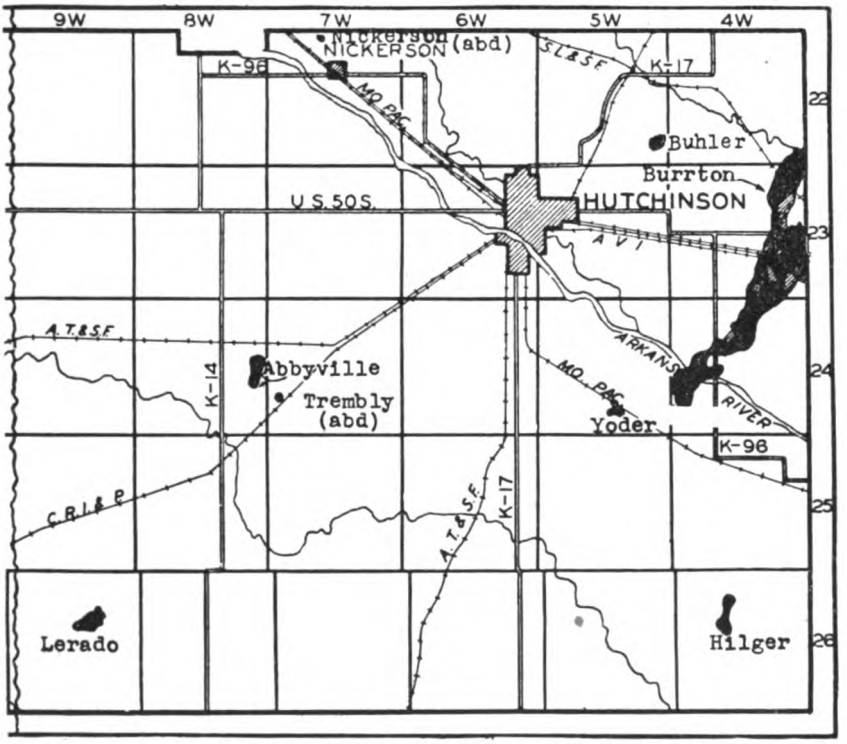

Fig. 25. Map of Reno county showing oil and gas pools.

Buhler Pool.—No new wells were drilled in this field in 1940. The Buhler pool has produced 298,000 barrels of oil to the end of 1940.

Burrton Pool.—The Burrton pool was extended slightly by the completion of eight wells, five in Reno county and the rest in Harvey county, all of which produce from the Mississippian "chat". Of the eight new oil wells, several were old "chat" wells that were drilled deeper into the thick zone of cherty detritus in which the oil occurs. Two other wells failed to find deeper production and were finished as salt-water-disposal wells.

Wildcat Wells.—Only three wildcat wells were drilled in Reno county in 1940. One of these, the Westgate Greenland Oil Company No. 1 Schlickau well, was drilled 3 miles south of the Burrton pool in another vain attempt to extend that remarkable pool. The well was abandoned at a depth of 3,613 feet after testing Mississippian limestone from 3,512 to 3,613 feet.

The second wildcat well was probably more significant, because it was drilled on the trend between the Abbyville and Lerado pools. It is the Shell Petroleum Corporation No. 1 Frazee well, in sec. 33, T. 25 S., R. 8 W. In this well the Ft. Riley was found at a depth of 1,425 feet, the Topeka limestone at 2,653 feet, the Lansing limestone at 3,220 feet, the Mississippian limestone at 3,803 feet, and the Kinderhook shale at 4,056 feet. At a depth of 4,240 feet the Arbuckle dolomite was encountered. When it proved to be dry the well was abandoned at a total depth of 4,280 feet.

The third wildcat well had attention focused on it because it was located only 7 miles northwest of the prolific Zenith pool. It is the Cities Service Oil Company No. 1 Crandall well, in sec. 23, T. 23 S., R. 10 W. In this well oil was found in the Viola at a depth of 3,785 to 3,798 feet. The showing was not sufficient to make a commercial well.

Oil and Gas Pools of Reno County

Pool and Location	Area acres	Cumulative production to end of 1940, bbls.	Number of wells	Producing zone	Depth in feet
Abbyville, 24–24–8W	1,200	372,400	4	Lans.-K. C.	3,540
Buhler, 25–22–5W	500	298,000	1	Viola	3,890
			10	Simpson	3,897
Burrton, 23–23–4W	5,000	30,569,500	337	"Chat"	3,266
			72	Hunton	3,583
			1	Arbuckle	3,775
Hilger, 16–26–4W	600	1,763,500	32	Viola	4,062
Lerado, 11–26–9W	1,800	2,090,650	1	Lans.-K. C.	3,535
			32	Viola	4,128
Yoder, 34–24–5W	500	69,100	6	"Chat"	3,450
Burrton (gas) 23–23–4W	5,000	41,597,964 M cu. ft.	52	"Chat"	3,298
Yoder (gas) 34–24–5W	500	.....	4	"Chat"	3,402

Rice County

One of the most actively exploited counties in Kansas during 1940 was Rice county. The completions for this year number 177 wells, of which 131 were commercial oil wells, 8 were gas wells, and the other 38 were dry holes. The series of successful completions in the Chase pool marks it as the most remarkable area in the county. The large number of pools in Rice county makes it advantageous to describe them in alphabetical order. The distribution of the pools is shown on the accompanying map (fig. 26).

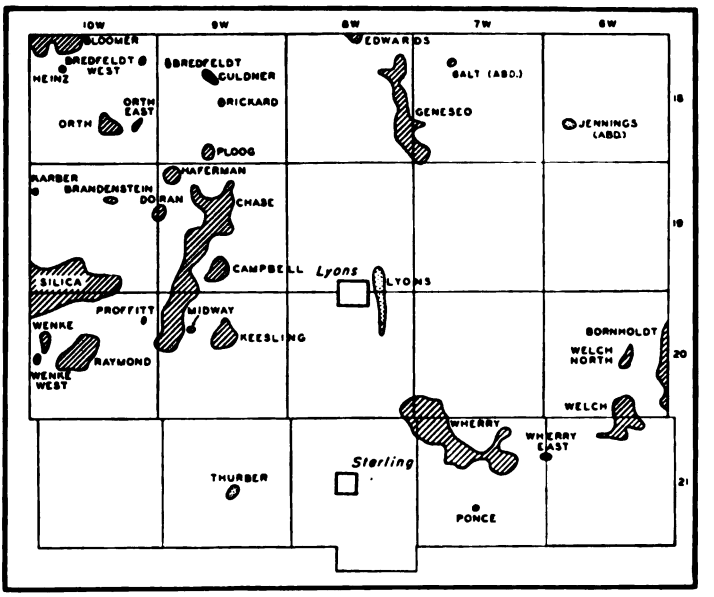

FIG. 26. Map of Rice county showing oil and gas pools. Oblique lines indicate oil pools, dots indicate gas pools.

Brandenstein Pool.—The Brandenstein pool, in sec. 11, T. 19 S., R. 10 W., was discovered in November, 1933. No new wells were added in 1940, but the two wells in that pool continued to produce oil, increasing the cumulative total production to 360,000 barrels at the end of the year. In an attempt to extend this pool, Pryor and Lockhart drilled a test well on the Southern farm in section 14, but the Arbuckle, which was reached at a depth of 3,284 feet, was dry and the well was abandoned about 40 feet lower.

Bredfeldt Pool.—The Bredfeldt pool, in the northwestern part of T. 18 S., R. 9 W., remained a one-well pool. It was discovered in April, 1937, and produces oil from the Arbuckle dolomite.

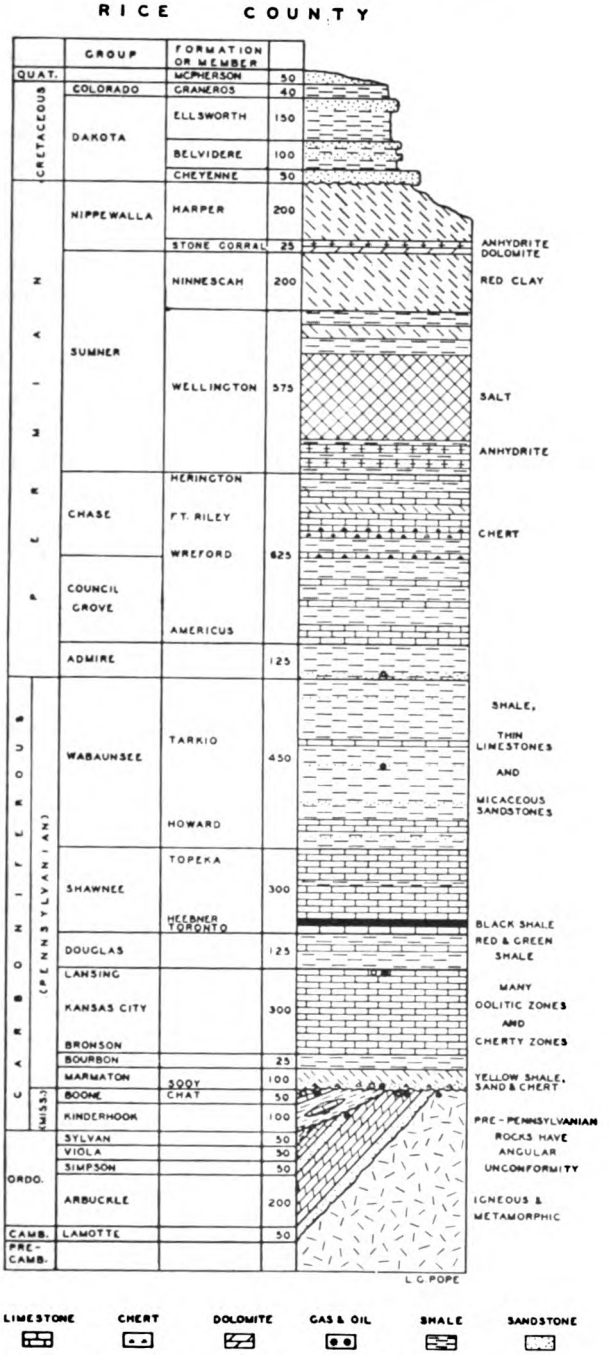

FIG. 27. Columnar section of rocks in Rice county. Drawn by L. G. Pope from data prepared by the author.

Bredfeldt West Pool.—The Bredfeldt West pool also remains a one-well pool. Two test wells drilled near it in an attempt to extend its limits were dry.

Campbell Pool.—The Campbell pool, located less than 1 mile east of the large Chase pool, produces from the Arbuckle dolomite at a depth of approximately 3,200 feet. In 1940 only six more oil wells were completed. Three dry holes drilled on the fringes of the pool, one in section 27 and two in section 33, set apparent limits to this pool. Nevertheless it is still possible that this pool may connect with the Chase pool across section 28. At present a distance less than 1 mile separates them. In 1940 a new producing zone was found in the Campbell pool. It is a porous zone in the Lansing-Kansas City limestone found in the Hinkle Oil Company No. 1 Truesdale well, in sec. 34, T. 19 S., R. 9 W. The production of this pool to the end of 1940 was 693,400 barrels.

Chase Pool.—One of the most important pools in Rice county is the Chase pool, which extends from sec. 10, T. 19 S., R. 9 W., southwestward to sec. 19, T. 20 S., R. 9 W., a distance of 9 miles. In 1940, activity in this pool was revived by the drilling of many wells northwest and northeast of the area previously drilled. Activity was especially great in sections 8, 9, and 15. The pool now has 237 wells and the production to the end of 1940 amounted to 20,381,700 barrels.

Doran Pool.—The Doran pool, located 3 miles west of the north end of the Chase pool, added no new wells in 1940.

Edwards Pool.—The Edwards pool, which lies in the northern part of the county and extends several miles northward into Ellsworth county, was the scene of active drilling. Completion of producing wells raised the total number to 68. The producing zone here also is the Arbuckle dolomite.

Geneseo Pool.—A short distance southeast of the Edwards pool lies the Geneseo pool, extending southward nearly 6 miles from a point just south of Geneseo townsite into sec. 6, T. 19 S., R. 7 W. In 1940 ten new producing wells were added in this pool. Most of these were drilled in secs. 12 and 24, T. 18 S., R. 7 W.

Guldner Pool.—In 1940 no wells were added. Production to the end of 1940 was 236,800 barrels.

Haferman Pool.—This pool was discovered in 1936. In 1940 one well was drilled, extending the pool northward.

Heinz Pool.—The Heinz pool, discovered in August, 1938, lies scarcely 1 mile south of the Bloomer pool. No wells were added in

1940. In the Bloomer pool to the north, 17 wells drilled in the Rice county portion indicate a future connection between the two pools.

Karber Pool.—The only new pool found in Rice county in 1940 is the Karber pool, named after the farm on which the discovery well was drilled. Although located only a short distance east of the Rick pool in sec. 7, T. 19 S., R. 10 W., it was nevertheless classified as a separate pool. The discovery well produces from the Arbuckle dolomite at a depth of 3,343 to 3,350 feet. Initial production of the well was 280 barrels per day.

Keesling Pool.—Three miles east of the Chase pool, near the center of T. 20 S., R. 9 W., lies the Keesling pool. In 1940 four more oil wells were added, bringing the total to 47. The total production to the end of 1940 was 2,612,800 barrels. In 1940 this pool was extended to the northeast, as three wells were completed in section 10.

Midway Pool.—The Midway pool was so named because it lies between the Chase and the Keesling pools. The distance to the nearest well in the Chase pool is less than 0.5 mile, and the probability is great that the Midway pool will be joined to the Chase pool. In 1940, however, no attempt was made to extend the pool.

Orth Pool.—This pool is particularly interesting because commercial amounts of oil have been produced here from pre-Cambrian quartzite. At the end of 1940 nine wells were still producing from this zone at a depth of approximately 3,240 feet. An extension to the north was made to the Orth pool during 1940. It is the Bartlett No. 1 Bieberle well in sec. 22, T. 18 S., R. 10 W.

Orth East Pool.—No wells were drilled in this field in 1940.

Ploog and Ponce Pools.—No additional development took place in the Ploog pool nor in the Ponce pool.

Proffitt Pool.—The Proffitt pool, discovered in 1938, lies in sec. 12, T. 20 S., R. 10 W., about 1 mile west of the Chase pool and about 3 miles east of the Silica pool. No additional wells were drilled during 1940.

Raymond Pool.—This is the second oldest pool in Rice county, having been discovered in July, 1929. In 1940, eight new wells served to revive the Raymond pool and extended its limits to the north and the southwest. The Raymond pool has produced a total of 5,792,000 barrels of oil.

Rickard and Stumps Pools.—Situated in the northern part of the county, between the Ploog and the Guldner pools, is the Rickard

area, unique because it produces from the Simpson sandstone. No new wells were added in 1940. The Stumps pool was joined to the Bloomer pool late in 1940.

Welch Pool.—The Welch pool is the oldest oil pool in Rice county. It was discovered in April, 1924, and 28 wells still produced oil at the end of 1940. The pool has produced more than 4,200,000 barrels of oil.

Welch North Pool.—The Welch North pool is separated from the main pool by a distance of about 1 mile. One new well was added here in 1940. This pool is now separated from the Bornholdt pool by a distance of only 1.5 miles.

Wenke Pool.—The Wenke and Wenke West pools were not extended during 1940. The fact that they lie so close to the Silica pool of eastern Barton county indicates that they may soon form a part of that pool.

Wherry Pool.—One of the most remarkable pools of the county, and indeed of Kansas, is the Wherry pool, which includes approximately 8,000 acres in the northern half of T. 21 S., R. 7 W. In 1940 the northwestern portion of this pool was extended into sec. 31, T. 20 S., R. 7 W., and sec. 36, T. 20 S., R. 8 W. It was also extended to the southeast by wells drilled in secs. 14 and 15, T. 21 S., R. 7 W. This pool has produced 6,672,600 barrels of oil to the end of 1940.

Wherry East Pool.—The Wherry East pool lies about 1 mile east of the main pool. No additional wells were drilled here in 1940.

Gas fields.—Considerable amounts of gas have been found in the various pools of Rice county. In some fields the amount is great enough to justify transportation and distribution. The total cumulative production from all gas pools in Rice county was more than 10,000,000,000 cubic feet.

Lyons Pool.—A contour map of this interesting pool is shown in figure 28. At the end of 1940 the open-flow pressure of the wells ranged from 700 to 1,000 pounds per square inch. The wells in section 11 showed the highest pressure. Net allowable production is based on the formula by which $\frac{5}{8}$ is allocated to acreage times pressure and $\frac{3}{8}$ to open-flow capacity. The open-flow capacity at the end of 1940 ranged from 2,000,000 to 50,000,000 cubic feet per day.

Thurber Pool.—The Thurber pool is situated in the southern part of the county, 7 miles west of Sterling. It produces gas from the Misener conglomerate at a depth of 3,317 feet.

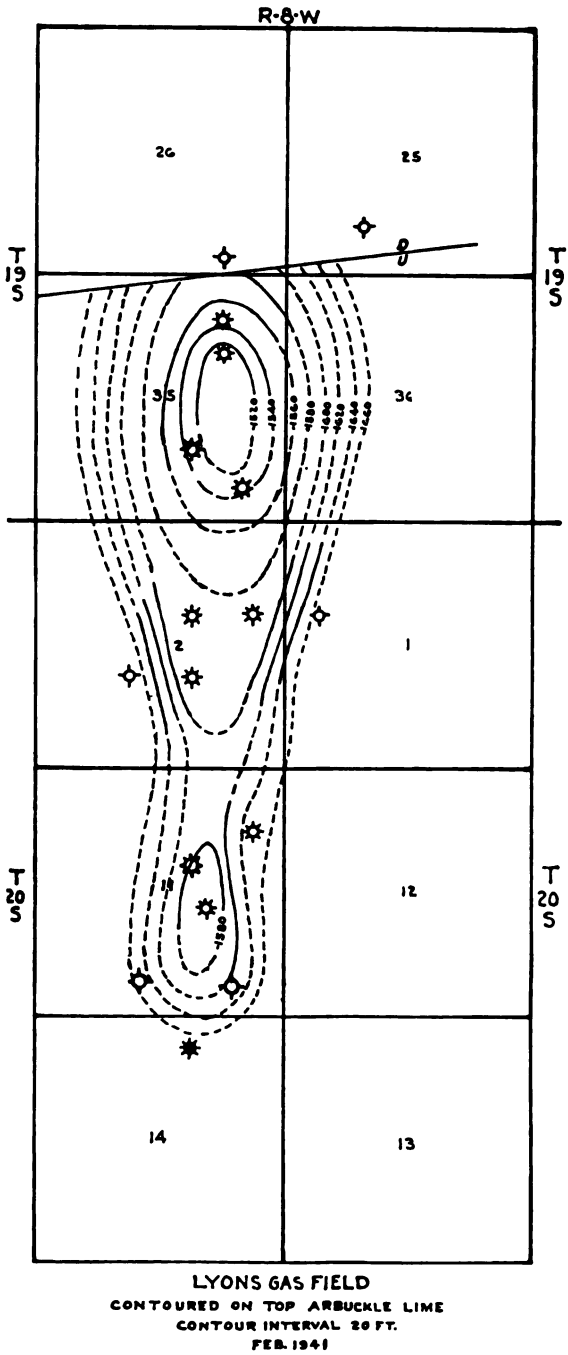

FIG. 28. Contour map of Lyons pool. Wells drilled in 1940 are indicated by larger symbols.

Wildcat wells.—Although many dry holes were drilled in Rice county in 1940 only a few of these can be regarded as wildcat wells. Perhaps eight should be included under this heading. Because of the close spacing between pools in the county even these are hardly rank wildcats. Nearly all were drilled into the Arbuckle dolomite in order to test all possible producing formations, but none penetrated completely through this formation, so information on geological conditions below the Arbuckle dolomite is not increased.

In the northeastern township of the county a test well was drilled in section 28. This well is located about 1.5 miles east of the abandoned Jennings gas pool. Three miles east of the Geneseo pool, R. E. Buckles drilled a test well on the Ramsey farm in sec. 9, T. 18 S., R. 7 W. No doubt one of the most interesting test wells is the one drilled by the Mid Plains Oil Company on the Newkirk farm. In this well the Mississippian limestone was absent and the drill passed directly from the Sooy into the Kinderhook at a depth of 3,204 feet. The Sooy was remarkable on account of the thickness of this sand body. It consists of large rounded and frosted grains. The Arbuckle was found at 3,482 feet.

The Cities Service Oil Company drilled a well on the Hilt farm in sec. 15, T. 19 S., R. 8 W. The Arbuckle was reached at a depth of 3,317 feet and the total depth was 3,326 feet. A well that seemed for a time to have opened another pool was the Alpine No. 1 Fair well, in sec. 10, T. 21 S., R. 9 W. A saturated oil-bearing zone was logged in Simpson dolomite at a depth of 3,382 to 3,390 feet. Tests indicated insufficient oil for commercial production.

Rice county stands out as one of the most prolific producing areas in the state. The production for 1940 was 6,240,330 barrels, not including any portion of the production from the Silica pool. This pool occupies approximately four townships, two of which lie in Rice county, but because the discovery well of the pool is located in Barton county, and because the production cannot well be allocated between the counties, it has all been assigned to Barton county in this report. The Silica pool produced 6,548,180 barrels in 1940. If half of this be added to the Rice county production, the total for Rice county is 9,488,420 barrels. The cumulative total for the county, not counting the Silica pool, is 51,143,745 barrels. If the production of the wells in the Rice county portion of the Silica pool be added, the total is 65,994,922 barrels.

Pool and Location	Area, acres	Cumulative production to end of 1940, bbls.	Number of wells	Producing zone	Depth in feet
Brandenstein, 10–19–10W	160	360,000	2	Lans.-K. C.	3,014
Bredfeldt, 7–18–9W	40	13,700	1	Arbuckle	3,223
Bredfeldt West, 12–18–10W	40	14,000	1	Arbuckle	
Campbell, 28–19–9W	1,000	693,400	3	Lans.-K. C.	
			25	Arbuckle	3,195
Chase, 32–19–9W	4,800	20,381,700	3	Lans.-K. C.	2,942
			234	Arbuckle	3,246
Doran, 13–19–10W	160	106,000	3	Arbuckle	3,291
Edwards, 3–18–8W	2,500	2,122,500	68	Arbuckle	3,278
Geneseo, 25–18–8W	4,600	5,090,100	154	Arbuckle	3,132
Guldner, 16–18–9W	160	236,800	3	Lans.-K. C.	2,884
			1	Arbuckle	3,227
Haferman, 6–19–9W	700	418,800	9	Arbuckle	3,192
Heinz, 8–18–10W	80	26,500	1	Lans.-K. C.	3,000
Karber, 7–19–10W	40	6,200	1	Arbuckle	3,343
Keesling, 10–20–9W	700	2,612,800	47	Arbuckle	3,239
Lyons, 14–20–8W	40	7,100	1	Simpson	3,274
Midway, 8–20–9W	240	85,100	6	Arbuckle	3,244
Orth, 27–18–10W	1,000	637,850	1	Lans.-K. C.	2,915
			10	Pre-Cambrian	3,240
Orth East, 25–18–10W	80	28,150	3	Pre-Cambrian	
Ploog, 33–18–9W	300	1,766,150	10	Arbuckle	3,252
Ponce, 28–21–7W	40	25,350	1	Sooy	3,388
Proffitt, 12–20–10W	40		1	Arbuckle	3,227
Raymond, 21–20–10W	1,000	5,792,000	5	Lans.-K. C.	3,130
			33	Arbuckle	3,330

Oil-and Gas Pools of Rice County—Concluded

Pool and Location	Area, acres	Cumulative production to end of 1940, bbls.	Number of wells	Producing zone	Depth in feet
Rickard, 22–18–9W	40	51,600	1	Simpson	3,285
			1	Arbuckle	3,324
Silica (a).					
Stumps (b).					
Welch, 2–21–6W	1,500	4,200,700	28	"Chat"	3,370
Welch North, 23–20–6W	160	37,650	3	"Chat"	3,334
Wenke, 7–20–10W	300	256,000	7	Arbuckle	3,360
Wenke West, 18–20–10W	80	29,900	2	Arbuckle	3,292
Wherry, 11–21–7W	8,000	6,672,600	193	Sooy	3,358
Wherry East, 12–21–7W	160	71,000	3	Sooy	3,455
Guldner (gas), 16–18–9W	160	.....	1	Lansing	2,884
Lyons (gas), 35–19–8W	1,500	8,006,851 M cu. ft.	1	Simpson	3,290
			13	Arbuckle	3,277
Orth (gas), 27–18–10W	640	.....	3	Lans.-K. C	2,906
Thurber (gas), 22–21–9W	160	1,601,587 M cu. ft.	3	Misener	3,317

(a) Silica pool described under Barton county.
(b) Stumps pool joined to Bloomer in 1940.

Rooks County

Oil pools of Rooks county are listed on the accompanying statistical page and were described in Mineral Resources Circulars 10 and 13 and Bulletin 28. In 1940 some wells were drilled in an effort to extend these pools and also to find new ones, but no new pools were discovered. Of the total of 46 test wells completed in 1940 in this county, 35 were oil wells and 11 were dry holes. Drilling was

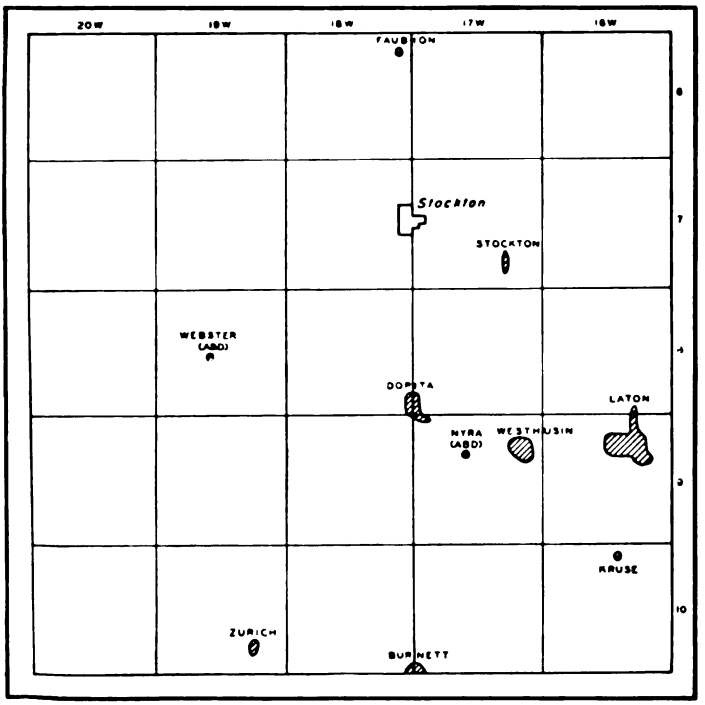

Fig. 29. Map of Rooks county showing oil pools.

active in only three pools, the Laton, Westhusin, and Burnett pools. A map showing distribution of pools in this county is given in figure 29, and a generalized section of the rocks in figure 30.

Laton Pool.—Considerable drilling in the Laton pool, 6 miles north of the Kruse pool, resulted in completion of 27 additional producing wells in 1940. Most of the drilling was concentrated on inside locations in secs. 11, 12, and 14, T. 9 S., R. 16 W. One of the old wells, the Broadview Oil Company No. 1 Livingood well, was deepened 36 feet to a second porous zone, and when recompleted it had an initial production of 519 barrels. Like other wells in the Laton pool these

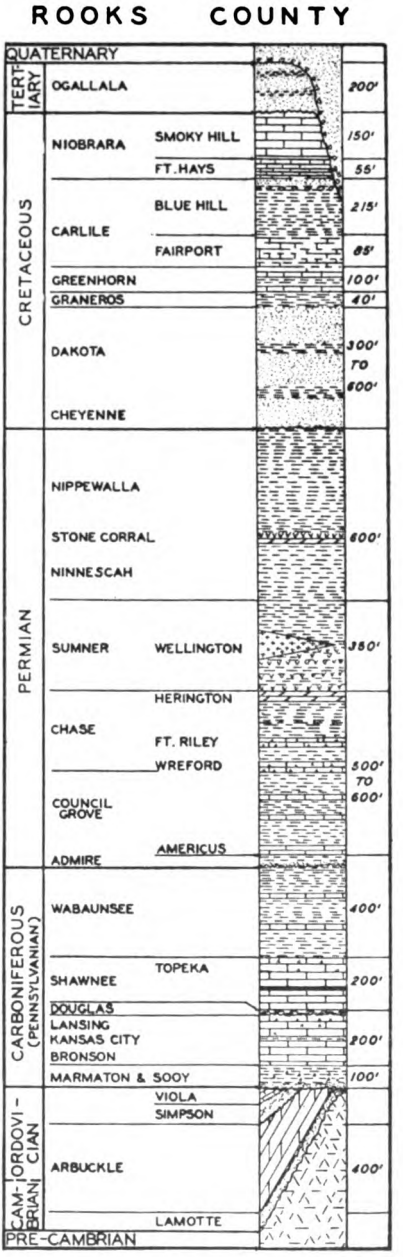

FIG. 30. Columnar section of rocks in Rooks county.

new wells derive their oil from the Lansing-Kansas City limestone. To the end of 1940 this pool had produced 572,100 barrels and stands in first place among the pools of Rooks county.

Stockton and Westhusin Pools.—There was no additional drilling in the Stockton pool, which produces oil from the Lansing limestone. The total production of the Stockton pool amounted to 23,000 barrels at the end of the year. In the Westhusin pool three small producing wells were completed. One of these, the Schermerhorn No. 1 Smith well, extends the pool southward into sec. 13, T. 9 S., R. 17 W. One dry hole was drilled in the NE¼ sec. 14, T. 9 S., R. 17 W.

Webster Pool.—The Webster pool was discovered in November, 1930. The original well was drilled by Aylward on the Silous ranch in the NE¼ sec. 21, T. 8 S., R. 19 W. It was abandoned in 1938 and the name Webster was dropped from the records. In August, 1940, Mitchell drilled a well on the Veverka lease and found oil in the Arbuckle dolomite at a depth of 3,434 to 3,435 feet. Initial potential production was 1,400 barrels of 20° A.P.I. gravity oil per day. The old name Webster was revived and the No. 1 Veverka thus becomes the second well in the pool. Incidentally it should be mentioned that the original well produced oil from the Lansing limestone at a depth of 3,225 feet and also from the Sooy conglomerate at 3,450 feet.

Zurich Pool.—No new producing wells were drilled in the Zurich pool, but one well was deepened 38 feet to a lower porous zone in the Lansing-Kansas City limestones. It is the No. 1 A well on the Johnson ranch in sec. 26, T. 10 S., R. 19 W. A new potential production of 135 barrels was established for the well.

Burnett Pool.—The Burnett pool lies chiefly in Ellis county but it extends a short distance into Rooks county. Two additional producing wells were drilled in the Rooks county extension in 1940. The potential production of one of these wells was more than 4,000 barrels per day. Three dry holes in this part of the pool seem to limit the Burnett pool to the north.

Exploratory Drilling.—In 1940, six rank wildcat wells were started in Rooks county. Two of these were drilled by the Cities Service Oil Company, one on the Johnson farm in sec. 5, T. 6 S., R. 19 W., and the other on the Hansen farm in section 15 of the same township. In the Hansen well the Lansing limestone was encountered at a depth of 3,343 feet and the Arbuckle at 3,635 feet. The Johnston well was also completed below the Arbuckle dolomite. In that well

the important marker bed called the Stone Corral dolomite, which lies near the base of the redbeds, was reached at a depth of 1,550 feet. The two marker beds in the Pennsylvanian system, the Topeka and the Lansing, were reached at 2,990 feet and 3,300 feet respectively. The Arbuckle dolomite, which was expected to produce oil, was found at 3,518 feet. It proved to be only 129 feet thick and rested upon the Lamotte sand at a depth of 3,647 feet. The pre-Cambrian rocks were entered at 3,669 feet and the well was abandoned at 3,670 feet.

A very important test well about half way between the Stockton and the Laton pools was drilled by the Palmer Oil Company on the Denio lease in sec. 17, T. 8 S., R. 16 W. In this well the Stone Corral dolomite was reached at a depth of 1,132 feet, about 241 feet higher than in the Johnston well. The Topeka was found at 2,720 feet and the Lansing limestone at 2,995 feet. The probable producing formation, the Arbuckle dolomite, was reached at 3,310 feet, but proved to be barren.

An interesting test well was drilled by the Gulf Oil Corporation about 4 miles north of the Westhusin pool, in sec. 23, T. 8 S., R. 17 W., on the Bruton ranch. This well found the Stone Corral high at a depth of 702 feet, or 1,232 feet above sea level. The Lansing limestone was reached at 3,079 feet, the Sooy conglomerate at 3,392 feet, and the Arbuckle dolomite at 3,450 feet. The well was abandoned as a dry hole at 3,483 feet. Two miles east of the Dopita pool Earl Wakefield completed a dry hole on the Diehl ranch in sec. 4, T. 9 S., R. 17 W. Here the Stone Corral dolomite was reached at a depth of 1,314 feet (694 feet above sea level,) and the Topeka limestone at 2,885 feet. The Lansing limestone was found at 3,140 feet, the Sooy conglomerate at 3,430 feet, and the Arbuckle dolomite at 3,461 feet.

Perhaps no test well was so closely watched at the Helmerick and Payne No. 1 Baumgarten well in sec. 25, T. 9 S., R. 19 W. Because the well was located about 6 miles north of the Zurich pool and in relatively untested territory the geological data are most interesting. The Stone Corral dolomite was found at an elevation of 641 feet above sea level, at a depth of 1,547 feet, the Topeka limestone at a depth of 3,101 feet, and the Lansing limestone at 3,374 feet. The Pennsylvanian basal conglomerate, the Sooy, was reached at a depth of 3,631 feet, and it was found to rest upon the Simpson formation of Ordovician age at 3,660 feet. The Arbuckle dolomite beneath the Simpson was reached at a depth of 3,675 feet, and the well was abandoned at 3,700 feet.

Oil Pools of Rooks County

Pool and Location	Area, acres	Cumulative production to end of 1940, bbls.	Number of wells	Producing zone	Depth in feet
Dopita, 31-8-17W.....	160	105,800	2	Lans.-K. C.	3,212
			5	Arbuckle...	3,409
Faubion, 12-6-18W.....	80	38,000	2	Lans.-K. C.	3,128
Kruse, 3-10-16W.....	40	11,000	1	Lans.-K. C.	3,115
Laton, 11-9-16W.....	400	572,100	39	Lans.-K. C.	3,228
Stockton, 26-7-17W.....	160	23,000	2	Lans.-K. C.	3,118
Webster, 21-8-19W.....	40	39,750	1	Arbuckle...	3,434
Westhusin, 11-9-17W....	400	311,800	11	Lans.-K. C.	3,231
Zurich, 26-10-19W.....	200	106,200	2	Lans.-K. C.	3,340

Rush County

Drilling activity in Rush county was considerably curtailed in 1940. Only four wells were completed, of which two were oil wells, one a gas well, and the other one a dry hole. The accompanying

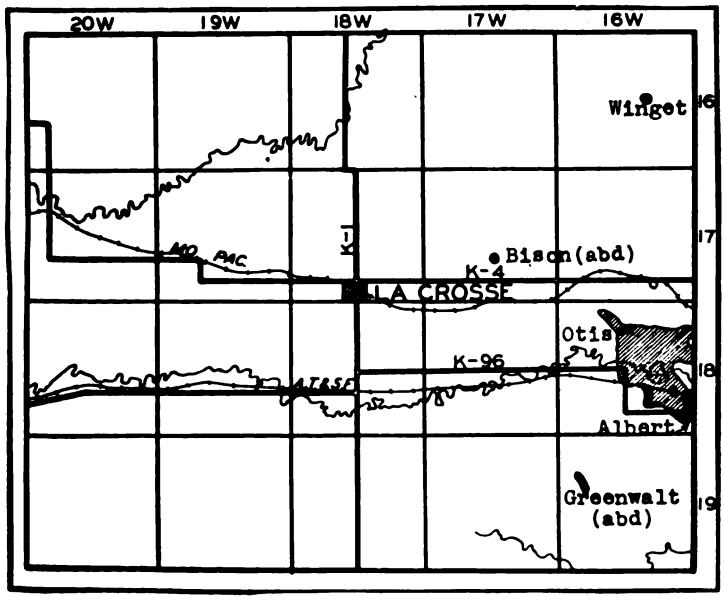

Fig. 31. Map of Rush county showing oil and gas pools.

map (fig. 31) shows two pools, one of which, the Otis pool, is a combination oil and gas pool, and the other, the Winget pool, is an oil pool.

Otis Pool.—At the end of 1940 there were 66 gas wells in the pool, some of which are located in Barton county, near Albert. The rock pressure was originally 1,350 pounds, but at the beginning of 1941 it averaged only slightly more than 625 pounds. The production has been prorated since January, 1938, according to this formula: acreage times pressure weighted at three-fourths, and open flow weighted at one-fourth of the whole. At the end of 1940 the market demand for dry gas purchased direct from the wells was fixed at 1,005,000,000 cubic feet for the month of January, 1941. The total open-flow potential at that time amounted to 1,737,000,000 cubic feet per day and the area producing gas was 13,490 acres. In 1940 the production was 9,709,900,000 cubic feet and the cumulative total to the end of the year was 54,135,900,000 cubic feet. In the Barton county portion of the Otis gas pool seven additional gas wells were completed. In capacity they range from 5,000,000 to 48,000,000 cubic feet. One dry hole drilled by Piggott on the Mary Schneider ranch in sec. 6, T. 18 S., R. 15 W., defined the pool on the north side.

The total number of oil wells at the end of 1940 was 17. The wells produced 288,370 barrels of oil during the year and have produced 1,397,000 barrels since 1934. One new oil well was drilled in 1940. It is the No. 4 Schroeder in the NE¼ sec. 36, T. 18 S., R. 16 W. A dry hole in the northeast corner of sec. 34, T. 17 S., R. 16 W., was drilled in 1940.

Winget Pool.—The Winget pool was discovered in December, 1936. Schoenfeldt and Kotch drilled the first well, in sec. 15, T. 16 S., R. 16 W., which produced from the Lansing limestone. No wells were added to this pool in 1940 but the discovery well was deepened from 3,247 feet to a depth of 3,545 feet to test a lower producing level, and a new potential of 3 barrels per day was established.

Oil and Gas Pools of Rush County

Pool and Location	Area, acres	Cumulative production to end of 1940, bbls.	Number of wells	Producing zone	Depth in feet
Otis, 10-18-16W.....	600	1,397,000	17	Lamotte....	3,527
Winget, 15-16-15W...	80	45,650	3	Lans.-K. C.	3,243
			1	Arbuckle...	3,537
Otis (gas), 11-18-16W	15,000	54,135,900 M cu. ft.	66	Lamotte....	3,507

Russell County

As usual, Russell county is outstanding among the areas in western Kansas because it had the largest number of completed wells (304) in 1940. Among these, 273 were oil wells and 31 were dry holes. Five new pools, the Driscoll, Greenvale Northwest, Lewis, Mahoney, and Davidson Northeast, record the success of wildcat drilling in 1940. Despite this fact, the total number of pools, 30, at the end of the year was only one more than at the end of the

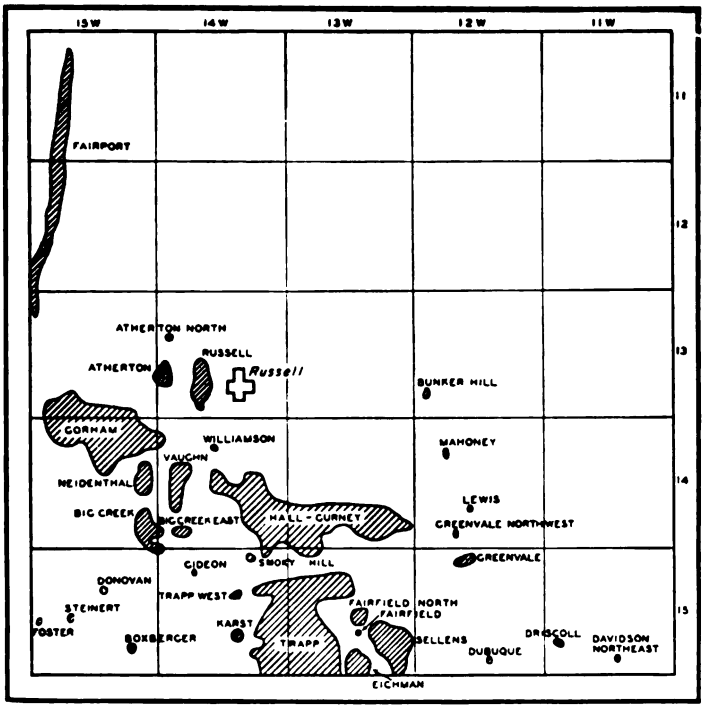

Fig. 32. Map of Russell county showing oil pools.

preceding year, owing to the fact that some pools were combined as a result of the successful completion of connecting wells. A map of Russell county, showing distribution of oil pools, is given in figure 32.

Inasmuch as the older pools were described in Mineral Resources Circulars 10 and 13 and Bulletin 28, they will not be mentioned here unless important additions or extensions were made. The accompanying table indicates the number of producing wells, the producing zones, and the production of each pool.

Atherton Pool.—The Atherton pool lies a few miles west of the townsite of Russell. In 1940, seven more oil wells were completed in the Atherton pool. Most of these were drilled in section 19 at the north end, thus reducing the gap between this pool and the Atherton North pool.

Big Creek Pools.—The Big Creek pool proper lies in secs. 25 and 36 of T. 14 S., R. 15 W. In 1940, one well was added to the main part of the pool and the field was extended to the south by two wells drilled in sec. 1, T. 15 S., R. 15 W., and sec. 6, T. 15 S., R. 14 W., respectively. The Big Creek East pool, which centers around the south line of sec. 30, T. 14 S., R. 14 W., and lies less than 1 mile east of the main pool, was discovered in 1938. In 1940 this pool was extended eastward by the completion of four wells.

Driscoll Pool.—One of the pools discovered in 1940 is the Driscoll pool. The discovery well was drilled by Hayes on the Driscoll ranch in the SW¼ sec. 30, T. 15 S., R. 11 W. Production is obtained from the Sooy conglomerate at a depth of 3,323 feet. An initial production of 646 barrels augurs well for the further development of this somewhat isolated part of the county. A second well completed in November by the Stanolind Oil Company found oil in the Arbuckle dolomite at a depth of 3,255 to 3,260 feet. This well was drilled in the SE¼ sec. 30, T. 15 S., R. 11 W.

Davidson Northeast Pool.—Three miles east of the Driscoll pool Braden and McClure completed a well on the Phillips ranch in sec. 34, T. 15 S., R. 11 W. It is the discovery well of the second pool found in 1940. Oil is produced from the Gorham sand at a depth of 3,309 feet.

Fairfield Pool.—In 1940, six additional wells were completed on the fringes of the pool. This extension of the pool brings it within 1 mile of the Sellens pool to the southeast, and also within 1 mile of the Fairfield North pool. The Trapp pool lies 1.5 miles west of the Fairfield pool. Very probably all these pools will eventually be merged into one extremely large producing area.

Fairfield North Pool.—In 1940 six addition producing wells were completed. The northern limits were extended until now only 0.5 mile separates this pool from the large Trapp pool.

Fairport Pool.—The oldest pool in the county is the Fairport pool, discovered in November, 1923. It had produced 14,443,000 barrels of oil to the end of 1940. At that time there were still 144 producing wells in the pool, which is only 1 fewer than a year previous. Some of the wells in the pool have been deepened to lower zones.

Gorham Pool.—The Gorham pool, 10 miles west of Russell, had produced more than 17,034,500 barrels of oil from 304 wells, to the end of 1940. Eight new producing wells were added to the Gorham pool in 1940. They extend the pool southward into sec. 15, T. 14 S., R. 15 W. The distance between the Gorham and Neidenthal pools is now less than 1 mile and the gap will probably be closed soon.

Greenvale Pool.—In 1940 six more producing wells were drilled.

Greenvale Northwest Pool.—In December, 1940, the Magnolia Petroleum Company completed its test well on the Borrell ranch in sec. 32, T. 14 S., R. 12 W. Potential production was 285 barrels per day. Although a distance less than 1 mile separates the new pool from the main Greenvale pool, the new name of Greenvale Northwest was established for it. The producing zone is the Lansing-Kansas City limestone.

Gurney Pool.—In 1940 the gap between the Gurney and the Hall pools was closed. The combined pool is now called the Hall-Gurney pool.

Hall-Gurney Pool.—The completion of approximately 30 new wells in the Hall-Gurney area not only proved that the two pools were part of the same reserve but also provided important extensions. The Gurney area was extended westward and northwestward, and it now reaches to the center of sec. 16, T. 14 S., R. 14 W. Concentrated drilling on the east side of the Hall area pushed the limits of the pool almost to the township line in that direction. At their meeting on July 9, 1940, the Nomenclature Committee voted to unite the Hall and Gurney areas under the name Hall-Gurney pool. The old Fink pool was also attached at the same time. This combined pool has an area of 13,600 acres. Two new producing zones were added in 1940 to an already big list. The Shields No. 4 Giese well in sec. 28, T. 14 S., R. 13 W., found oil in a sandstone near the base of the Wabaunsee formation at a depth of 2,325 to 2,326 feet. The Stanolind No. 5 Ben Rein well in sec. 25, T. 14 S., R. 14 W., found oil in a limestone within the Wabaunsee formation. Thus the wells in this pool produce from eight different levels in the stratigraphic sequence. (Fig. 1).

Lewis Pool.—In October, 1940, the Jones and Shelbourne well on the Lewis ranch in the NE¼ sec. 28, T. 14 S., R. 12 W., was completed in a porous zone in a limestone of the Wabaunsee formation at a depth of 2,317 to 2,329 feet. The measured potential production was 1,463 barrels per day.

Mahoney Pool.—In July, 1940, another new pool was found in the township in which the Lewis pool is located. The discovery well was completed on the Mahoney ranch in sec. 8, T. 14 S., R. 12 W., by Jones et al. Oil was found in the Lansing-Kansas City limestone at a depth of 2,977 to 2,980 feet. This zone lies 34 feet below the top of the Lansing limestone. Considerable gas also came into the hole at 2,980 feet.

Neidenthal Pool.—The Neidenthal pool was discovered in August, 1934, when a test well was completed in sec. 23, T. 14 S., R. 15 W. By the end of 1937 the pool had 14 wells producing from the Arbuckle dolomite. In 1940, three additional producing wells were completed along the north line of section 13, extending the pool within a short distance of the east end of the Gorham pool. Another producing zone, the Lansing-Kansas City limestone, was found to be productive in the Shelburne No. 1 Neidenthal well in the NW¼ sec. 13, T. 14 S., R. 15 W.

Smoky Hill Pool.—No new wells were added in 1940.

Trapp Pool.—The Arbuckle dolomite produces oil in 557 wells and the Lansing in 34 wells. At the end of the previous year there were only 546 wells in the pool. This discrepancy is partly due to the merging of the Anschutz pool in 1940. Only one location now separates the Trapp pool from wells in the Eichman pool in sec. 33, T. 15 S., R. 13 W.

By the end of 1940, drilling in the Trapp area had revealed much interesting geological information about the Ordovician and pre-Cambrian rocks. The contour map, plate 1, shows some of these features. It will be noted that the surface of the Arbuckle dolomite lies at an average altitude of 1,430 feet below sea level over an area of 10 to 12 square miles. This surface seems to indicate a pre-Pennsylvanian mesa, the sides of which descend almost uniformly to an altitude of about –1460 feet and then more abruptly to considerably lower levels.

The mesa is marked by at least 12 depressions, which seem to be sinkholes in the ancient calcareous terrane. They range in depth from a few feet to 168 feet. The deepest one is the sinkhole in the NE¼ sec. 12, T. 16 S., R. 14 W. The opposite kind of topographic feature, the sharp butte or needle, is also present. In the Karst area such a needle is revealed by drilling in the NE¼ sec. 27, T. 15 S., R. 14 W. Another may be noted on the contour map near the south center line of sec. 29, T. 15 S., R. 13 W. It has a relief of 30 feet. In the south part of the Trapp pool, in sec. 18, T. 16 S., R. 13 W., a

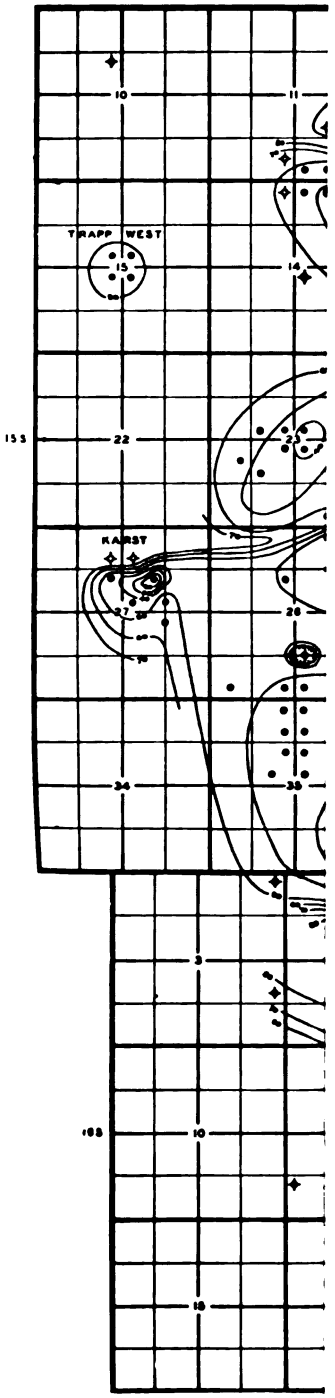

PLATE 1. Cont
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pre-Cambrian peak projects to an altitude of –1393 feet. At the north end of the Trapp pool a similar pre-Cambrian needle is present along the east line of sec. 8, T. 15 S., R. 13 W. This needle is 60 feet high, has no Lamotte sandstone or Arbuckle above it, and is 100 feet higher than the Arbuckle dolomite in a sinkhole 0.25 mile southwest.

Narrow depressions resembling ravines may be noted around the periphery of the central mesa. The most prominent one begins in the SE¼ sec. 32, T. 15 S., R. 13 W., and trends northeastward toward a deep sinkhole in section 28 and another deep dry hole in the NW¼ sec. 27. Less clearly defined is the ravine or drainage system that begins in the SE¼ sec. 19, T. 15 S., R. 13 W., and trends northwestward through section 18. This drainage system seems to have a deep tributary ravine that starts in the southeast corner of sec. 11, T. 15 S., R. 14 W. Other similar depression areas that simulate ravines may be noted on the contour map, plate 1.

Most interesting is the discovery that thickness of the Ordovician and Cambrian strata varies greatly in the Trapp area. This variation is perhaps best shown in the southern part of the Trapp pool proper in secs. 7 and 18, T. 16 S., R. 13 W., and adjacent parts of the neighboring township to the west. In the SW¼ of sec. 7 there are two deep test holes in which the Arbuckle and the Reagan or Lamotte sandstone are missing. One of these holes is offset by a well that penetrated 20 feet of Arbuckle dolomite and the other by a well having 17 feet of Arbuckle dolomite. Only 0.5 mile southwest is a deep test hole in which the Arbuckle is 265 feet thick, and the same distance to the northwest a test hole reveals the Arbuckle to be 85 feet thick. In the test well in which the thickest Arbuckle section was found, the Lamotte sandstone below the dolomite was 60 feet thick. In the other test hole the Lamotte sandstone is entirely absent.

Farther north in the Trapp area a test hole in sec. 32, T. 15 S., R. 13 W., was drilled through 78 feet of the Arbuckle dolomite, and another well in nearby sec. 29 penetrated 214 feet of Arbuckle dolomite. Three miles farther north the dolomite is entirely absent, but two miles to the northwest it has a thickness of 110 feet. In section 26 of the same township, one well was drilled into pre-Cambrian quartzite without finding any dolomite at all, but another well less than 0.25 mile away penetrated 98 feet of Arbuckle dolomite. Such data indicate that the pre-Cambrian floor on which the Cambrian and Ordovician sediments were laid down was relatively

uneven and had considerable relief in places. The data also suggest that nearly all such irregularities were eliminated by the time Ordovician deposition was complete in this region.

Another significant conclusion drawn from study of the contour map is that oil accumulation is controlled primarily by pre-Pennsylvanian topographic relief and only subordinately by structural relief. It can be shown, for instance, that the strata that overlie the Arbuckle dolomite in the Trapp area are slightly warped by movements of the crust after Pennsylvanian time, or, at any rate, between Ordovician and Permian time. These broad warpings have tended to emphasize in some cases the topographic relief on the Arbuckle dolomite, but the distribution of oil wells and dry holes is plainly related to relative altitude of the top of the Arbuckle dolomite, which in turn is controlled by pre-Pennsylvanian topography.

Trapp West Pool.—In 1940 one more producing well was added to this pool.

Production Data.—The production of oil from the many pools in Russell county is impressive; 12,004,325 barrels of oil was marketed in 1940, and the total cumulative production was 68,200,946 barrels to the end of 1940. In this connection it should be recalled that part of the Trapp pool, production of which is included, lies in Barton county.

Wildcat Wells.—In 1940 many test wells were drilled at distances of 0.5 mile or more from the nearest producing well. These are classified as wildcat wells. Those that were drilled at least 2 miles from any producing well or pool are classified as rank wildcats. Among the 36 wildcat wells, 11 were rank wildcats. Five of these were successful in finding new pools and six were dry.

One of the rank wildcat wells that failed in its objective was the Cities Service Oil Company No. 1 Rochester Trust well, in sec. 11, T. 13 S., R. 15 W., 2 miles north of the Atherton North pool. The Arbuckle was reached at a depth of 3,238 feet. The same company drilled another dry hole 4 miles east of the Greenvale pool in sec. 36, T. 14 S., R. 12 W. In this well the Arbuckle was reached at a depth of 3,130 feet.

Earl Wakefield drilled a dry hole on the Schmitberger lease 2 miles north of the Gorham pool in sec. 17, T. 13 S., R. 15 W. The Arbuckle dolomite was reached at a depth of 3,308 feet, but all zones were barren. Two dry holes were drilled by Pryor and Lockhart in the southeasternmost township, T. 15 S., R. 11 W. One of

Pool and Location	Area, acres	Cumulative production to end of 1940, bbls.	Number of wells	Producing zone	Depth in feet
Anschutz (a)					
Atherton, 30–13–14W	1,800	874,900	9	Lans.-K. C.	3,008
			27	Arbuckle	3,284
Atherton North, 18–13–14W	40	3,900	1	Arbuckle	3,130
Big Creek, 36–14–15W	1,000	1,494,000	1	Lans.-K. C.	2,908
			24	Gorham	3,152
			9	Arbuckle	3,171
Big Creek East, 31–14–14W	200	79,700	5	Lans.-K. C.	
			3	Arbuckle	3,149
Boxberger, 36–15–15W	160	126,500	4	Lans.-K. C.	3,147
Bunker Hill, 31–13–12W	160	64,600	4	Lans.-K. C.	2,965
Davidson Northeast, 34–15–11W	40	none	1	Gorham	3,309
Donovan, 10–15–15W	40	32,350	1	Lans.-K. C.	3,193
Driscoll, 30–15–11W	80	4,000	1	Sooy	3,323
			1	Arbuckle	3,255
Dubuque, 34–15–12W	160	145,700	3	Arbuckle	3,275
Eichman, 34–15–13W	800	616,000	6	Arbuckle	3,316
Fairfield, 22–15–13W	40	6,000	1	Arbuckle	3,352
Fairfield North, 16–15–13W	400	89,200	2	Lans.-K. C.	3,112
			8	Arbuckle	3,332
Fairport, 8–12–15W	3,600	14,443,000	144	Lans.-K. C.	2,950
				Gorham	3,211
Foster, 19–15–15W	40	12,900	1	Lans.-K. C.	3,114
Gideon, 8–15–14W	40	38,000	1	Sooy	3,266
Gorham (b), 5–14–15W	7,000	17,034,500	1	Tarkio	2,525
			11	Topeka	2,765
			144	Lans.-K. C.	3,027
			2	Arbuckle	3,289
			146	Gorham	3,299
Greenvale, 4–15–12W	320	154,100	8	Lans.-K. C.	3,040
			6	Arbuckle	3,267

Oil Pools of Russell County—Concluded

Pool and Location	Area, acres	Cumulative production to end of 1940, bbls.	Number of wells	Producing zone	Depth in feet
Greenvale Northwest, 32–14–12W	40	none	1	Lans.-K. C.	
Hall-Gurney (c), 30–14–13W	14,000	5,981,300	2	"Wabaunsee"	
			3	Topeka	2,675
			269	Lans.-K. C.	2,985
			29	Gorham	3,165
			4	Arbuckle	3,451
			12	Lamotte	3,129
			3	Pre-Cambrian	3,156
Karst, 27–15–14W	160	174,000	5	Arbuckle	3,315
Lewis, 28–14–12W	40	1,570	1	"Wabaunsee"	2,317
Mahoney, 8–14–12W	160	6,300	3	Lans.-K. C.	2,977
Neidenthal, 23–14–15W	600	842,100	1	Lans.-K. C.	
			10	Arbuckle	3,246
Russell, 22–13–14W	1,200	4,389,250	3	Lans.-K. C.	3,195
			46	Arbuckle	3,280
Sellens, 26–15–13W	1,200	2,360,000	26	Lans.-K. C.	3,088
				Arbuckle	3,352
Steinert, 21–15–15W	40	35,730	1	Lans.-K. C.	3,060
Trapp (d), 23–15–14W	26,640	18,335,000	2	Topeka	2,889
			34	Lans.-K. C.	3,062
			1	Sooy	
			557	Arbuckle	3,252
Trapp West, 15–15–14W	160	37,900	4	Arbuckle	3,249
Vaughn, 17–14–14W	1,000	771,400	22	Lans.-K. C.	3,004
			2	Gorham	3,282
			4	Arbuckle	
Williamson, 9–14–14W	160	45,550	2	Tarkio	2,522

(a) Anschutz joined to Trapp in 1940.
(b) Gorham includes Dumler, Milberger, Peterson, Sullivan.
(c) Hall and Gurney joined in 1940. Includes Smoky Hill.
(d) Production of Russell county portion of Trapp pool 14,792,500.

these, on the Borrell lease in section 3 reached the Simpson at a depth of 3,209 feet and Arbuckle dolomite 5 feet lower. This well was located 5 miles east of the Greenvale pool. The other well was located in section 12 northwest of the Stoltenberg pool of Ellsworth county.

Scott County

The history of oil and gas developments in Scott county was briefly reviewed in Mineral Resources Circulars 10 and 13 and Bulletin 28. In the Shallow Water oil pool (fig. 33) one well was com-

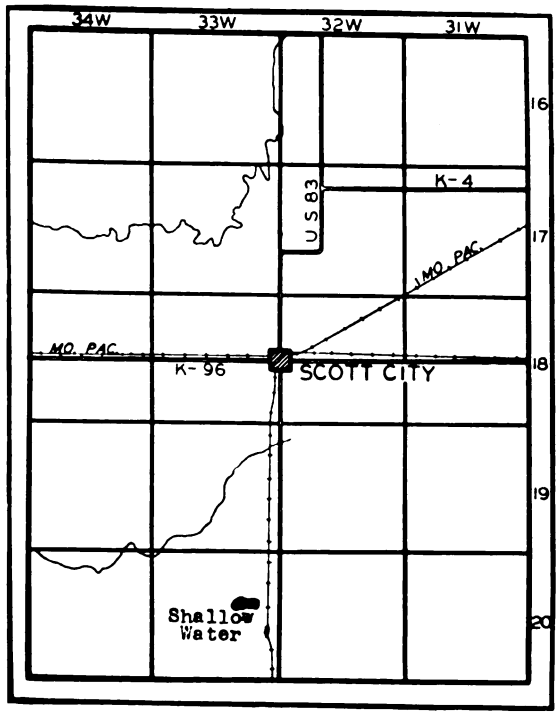

Fig. 33. Map of Scott county showing oil pool.

pleted in 1940, so the total number is now nine. The Shallow Water pool produced 152,500 barrels of oil in 1940. The cumulative total production to the end of 1940 was 902,500 barrels. The latest well was drilled in the southwest corner of section 11 and thus extends the pool 0.5 mile northward. The top of the producing formation, the Mississippian limestone, was found at a depth of 4,587 feet, but the porous oil-bearing zone lies deeper, at 4,653 to 4,670 feet.

Sedgwick County

At the present time there are ten active oil pools and one gas pool in Sedgwick county.

Andover South Pool.—No wells were added in 1940.

Eastborough North Pool.—No wells were drilled in 1940.

Goodrich Pool.—No wells were drilled in 1940.

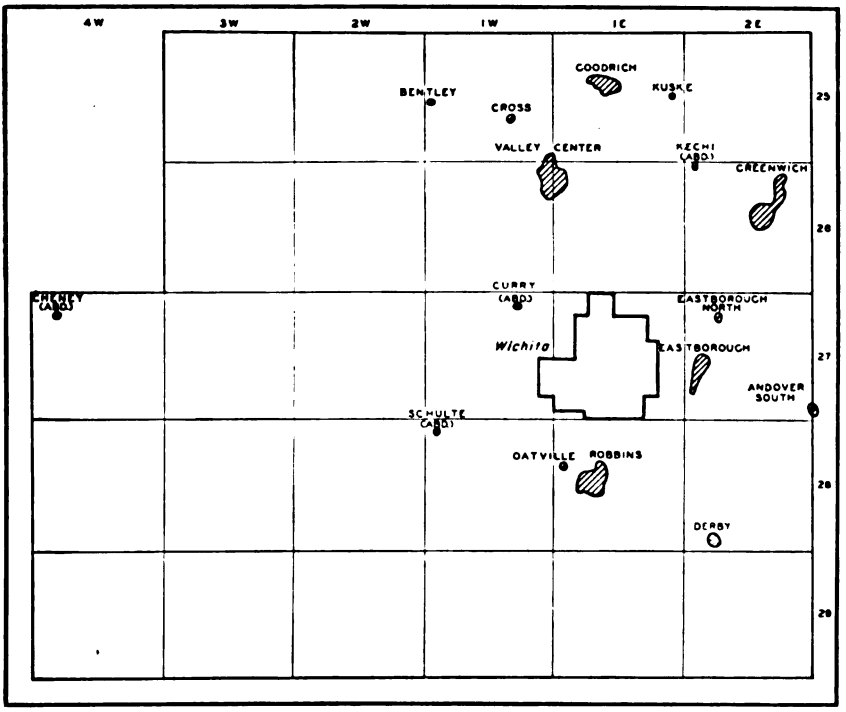

Fig. 34. Map of Sedgwick county showing oil and gas pools. Oblique lines indicate oil pools, dots indicate gas pools.

Robbins and Valley Center Pools.—In the Robbins pool in 1940 some wells were abandoned, but the production of the remaining wells is still satisfactory.

The Valley Center pool also is depleted and is approaching abandonment. In 1940 three wells were abandoned. The production for the year was 267,700 barrels. One well on the Wentz Bright lease was deepened to 4,274 feet and is being used as a water-disposal well.

SEDGWICK COUNTY

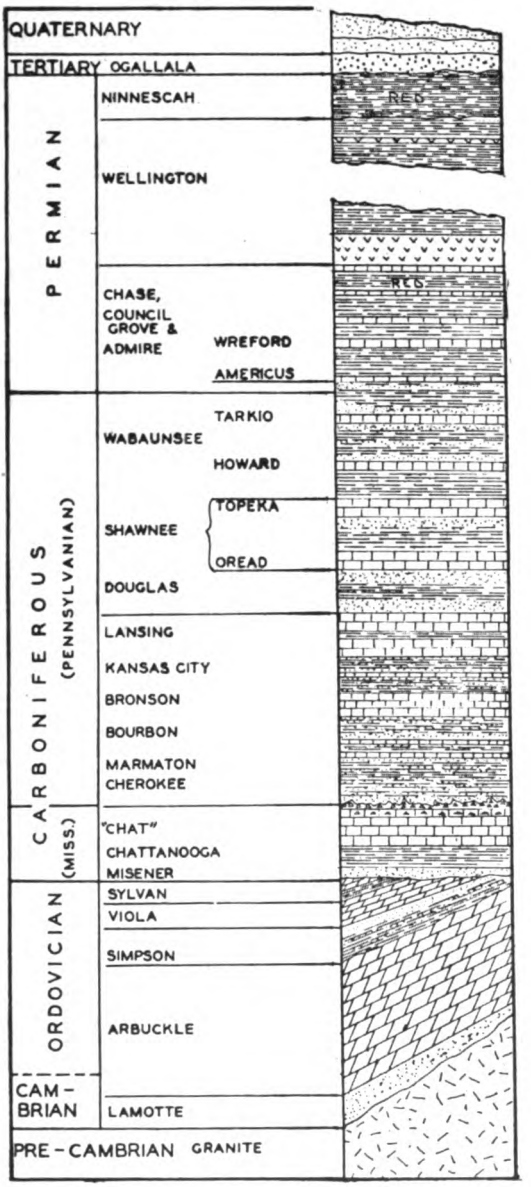

FIG. 35. Columnar section of rocks in Sedgwick county.

Wildcat Wells.—Only four wildcat wells were drilled in 1940, and none of these was located far from a producing area. In sec. 21, T. 27 S., R. 1 W., G. A. Fuller drilled a test well on the Stitt farm. It had good shows of oil at depths of 2,678 to 2,682 and 2,797 feet, in the Lansing-Kansas City limestone. When pumped it yielded about 23 barrels of oil a day. The gravity of the oil is 35° A.P.I. The showing was not encouraging and the well was therefore drilled down to the Arbuckle dolomite. At a depth of 3,661 feet the bit entered the dolomite and penetrated it to 3,667 feet without finding oil. In 1940 this well produced about 1,000 barrels of oil.

A second well in Sedgwick county was drilled by Bartlett on the Schmitz farm in sec. 5, T. 28 S., R. 1 W. This location is near the old Schulte pool, which was abandoned in 1936. In the new well all possible producing zones were barren.

The third wildcat well was drilled by the Sunray Oil Company on the McMinn farm in sec. 14, T. 29 S., R. 2 W., about 8 miles west of the Schulte pool. It had a good show of oil at a depth of 3,570 to 3,590 feet, which is about 6 feet below the top of the Mississippian limestone. It was drilled to the Arbuckle dolomite at 4,030 feet and abandoned at 4,055 feet. A wildcat well in section 15 of the same township was drilled by the Olson Drilling Company on the MacRedie farm. It also was dry and was abandoned at 3,576 feet, in the Mississippian rocks. One well was drilled in the eastern ranges by Max Steinbuchel on the Vilm farm. This test, located 0.5 mile north of the Oatville pool, was abandoned in the Simpson formation when water was found instead of oil.

Pool and Location	Area, acres	Cumulative production to end of 1940, bbls.	Number of wells	Producing zone	Depth in feet
Andover South, 36–27–2E	80	15,372	1	Simpson	3,098
Bentley, 19–25–1W	40	12,600	1	Lans.-K. C.	2,911
Cross, 27–25–1W	160	70,000	2	Lans.-K. C.	2,690
Eastborough, 19–29–2E	1,000	7,871,700	45	"Chat"	2,956
				Viola	3,258
Eastborough North, 8–27–2E	80	4,000	2	Viola	3,258
Goodrich, 16–25–1E	640	2,650,900	34	Lans.-K. C.	2,614
				"Chat"	3,010
				Misener	3,334
Greenwich, 14–26–2E	700	6,290,000	42	"Chat"	2,865
				Viola	3,321
				Simpson	.....
Kuske, 24–25–1E	40	137,450	1	Sooy	3,489
Oatville, 18–28–1E	40	10,000	1	Simpson	3,489
Robbins, 20–28–1E	420	2,878,400	52	Mississippi lime	3,090
Stitt, 21–27–1W	40	1,000	1	Lans.-K. C.	.....
Valley Center, 1–26–1W	1,500	19,905,600	67	Lans.-K. C.	2,579
				Misener	3,368
				Viola	3,366
Derby (gas), 32–28–2E	160	(abandoned)	3	Stalnaker	2,215

Stafford County

Of the total of 158 wells drilled in Stafford county in 1940, only 21 were dry holes. Most of the new oil wells were completed in the sensational Zenith pool, situated in the southeastern part of the county. In this pool alone 80 wells were drilled. The distribution of Stafford county pools is shown in figure 36.

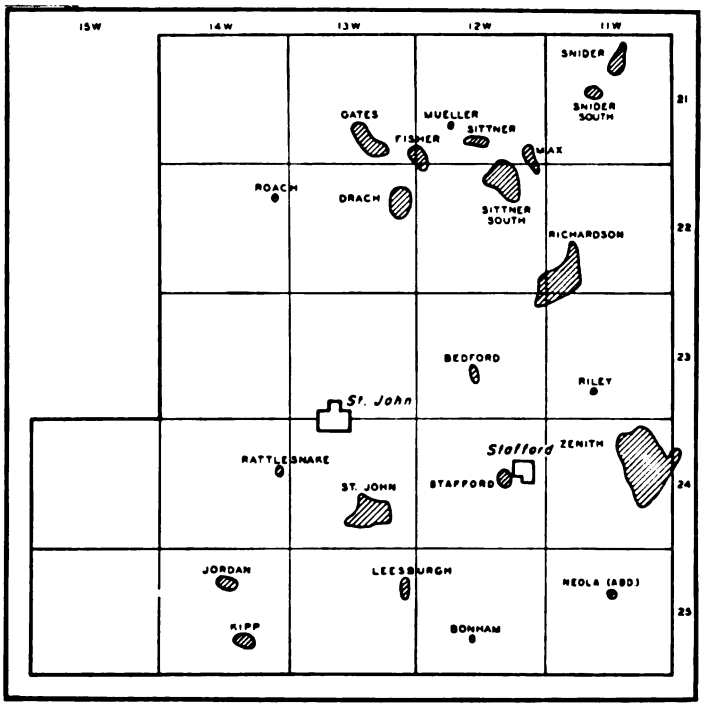

Fig. 36. Map of Stafford county showing oil pools.

Among the wildcat wells, four were successful in finding new oil pools. They are the discovery wells in the Bedford, Riley, Roach, and Stafford pools, described below.

Bedford Pool.—One of the new pools discovered in 1940 was the Bedford pool. The discovery well was drilled in August by the Shell Oil Company on the Bean lease in the SW¼ sec. 21, T. 23 S., R. 12 W. In this well the Lansing limestone was barren, but oil was found at a depth of 3,839 to 3,848 feet, within the Arbuckle dolomite. Initial production was 2,700 barrels, so offset wells were soon underway and the pool included seven oil wells before the year ended.

Jordan Pool.—The Jordan pool was discovered in December, 1936. The first well in the pool was the Atlantic Producing Company No. 1 Jordan well, in sec. 15, T. 25 S., R. 14 W., which found oil in the Lansing limestone. By the end of the next year four producing wells had been completed. None were added is 1938 or 1939, but in 1940 one well was added, to extend the pool 0.25 mile southwest. This very large well, which has a potential production of 17,000 barrels per day, should stimulate drilling in southern Stafford county.

Kipp Pool.—The Kipp pool also was discovered in December, 1936. It lies 2 miles southeast of the Jordan pool, in and near sec. 27, T. 25 S., R. 14 W. The first well in this pool failed to find oil in the Lansing-Kansas City limestones, but did find a porous zone in the Viola limestone and was completed therein. In 1940 two additional wells were drilled in this pool, bringing the total to four.

Leesburgh Pool.—In 1940 two wells were added to the Leesburgh pool, which had been opened by the Continental Oil Company well on the Fair ranch in sec. 12, T. 25 S., R. 13 W. Oil was found in a porous zone 9 feet thick, which lies only 2 feet below the top of the Arbuckle dolomite.

Max Pool.—In 1940 three producing wells were completed in the Max pool. All produce oil from the Arbuckle dolomite.

Rattlesnake Pool.—The Rattlesnake pool was opened in 1938 by the Atlantic Refining Company. In this pool oil is produced from a porous zone about 9 feet thick, which lies within the Lansing-Kansas City limestone sequence. The Arbuckle was tested in the original well, but was barren. The two test wells drilled near the Rattlesnake pool in 1940 were both dry.

Richardson Pool.—The Richardson pool is the oldest pool in Stafford county. It was discovered in September, 1930, by a rank wildcat well drilled in sec. 36, T. 22 S., R. 11 W., by the Midwest Exploration Company (now the Stanolind Oil Company). Oil is derived from the Arbuckle dolomite, which is covered by a thin sheet of Simpson shale. One new producing well and one dry hole were drilled in section 29 in 1940.

Riley Pool.—One of the new pools found in 1940 was the Riley pool in T. 23 S., R. 11 W., about 2 miles northwest of the Zenith pool. The discovery well was completed in September by the Shell Oil Company. It was a rank wildcat well in the SW¼ sec. 28. The top of the Lansing limestone was found at a depth of 3,323 feet. Oil from a porous zone 48 feet lower and only 5 feet thick

filled the hole rapidly. On official test, the well produced at the rate of 1,342 barrels in 24 hours.

Roach Pool.—Another new pool for 1940 was the Roach pool, 2 miles south of Seward in sec. 12, T. 22 S., R. 14 W. The discovery well was completed by Thayer and McMorrow on December 31, 1940. Although a small well, it nevertheless indicates that the western portion of Stafford county has oil possibilities, and it will doubtless lead to further drilling. The producing zone is the Arbuckle dolomite, the top of which was found at a depth of 3,749 feet. When the oil zone was first penetrated a thick sludge of tar, heavy crude oil, and water provided a puzzling combination for the operators. This was treated with butane and acid and finally cleared up for a test.

Sittner South Pool.—In 1940 this pool experienced an enthusiastic drilling revival, which resulted in completion of 12 new producing wells and the addition of a new producing zone. Nearly all the new wells were drilled in section 2, thus extending the pool eastward and closing the gap between it and the Max pool. One dry hole drilled in 1940 in the SE¼ sec. 2 will temporarily delay the union of the two pools.

Snider South Pool.—In 1940 six additional oil wells were completed. Five of them were drilled in section 17 and they extend the pool westward. One of the new wells in section 17, the Champlin No. 1 Smith well, found oil in the Simpson formation. If this should turn out to be a commercial well it will mean a new producing zone for the pool.

Stafford Pool.—Less than 1 mile west of the town of Stafford, Stanolind Oil Company drilled a test well on the Charles lease in sec. 15, T. 24 S., R. 12 W. The test was successful in finding oil but at an unexpected level—the Viola limestone. The Viola was found at a depth of 3,815 feet. At 3,835 feet the oil started coming into the hole. The porous zone was later proved to be 14 feet thick. At the end of the year there were four very large producing wells and two dry holes. One of the dry holes, the Continental No. 1 Roehms well, was drilled 700 feet deeper and made into a salt-water-disposal well.

Zenith Pool.—In 1940 this pool was extended in several directions, especially northward and westward. Drilling was extremely active in sec. 12, T. 24 S., R. 11 W., but many wells were drilled in section 3 and some in section 15. In 1939, in an attempt to extend the pool

northeastward into Reno county, Landon drilled a test well in the southwest corner of sec. 7, T. 24 S., R. 10 W. The Misener sand was found at a depth of 3,775 feet, but proved to be dry. In 1940 this well was deepened to 3,798 feet, into the Viola limestone. A test showed a potential production of 317 barrels per day. The Zenith pool now has 249 producing wells and had produced 3,517,100 barrels of oil to the end of 1940.

Exploratory Wells.—Of the ten wildcat wells drilled in Stafford county in 1940, four opened new oil pools. The other six are valuable only for the new geological data revealed by them. One of the most interesting wells is the Charles Seaney No. 1 Boyd well in sec. 4, T. 21 S., R. 14 W. In this well, located about 12 miles west of the Gates pool and about an equal distance east of the Pawnee Rock pool, the marker bed in the Permian redbeds known as the Stone Corral dolomite was found at a depth of 850 feet, 1,081 feet above sea level. The two marker beds in the Pennsylvanian system, the Topeka and Lansing limestones, were reached at depths of 3,133 feet and 3,330 feet, respectively, and the basal conglomerate, the Sooy, was found at 3,556 feet. The Ordovician Viola limestone was found at 3,562 feet, and it proved to be only 15 feet thick. The Simpson formation was found at 3,577 feet and the Arbuckle dolomite at 3,645 feet.

Another far western rank wildcat well was drilled by the Zephyr Drilling Company on the Moon lease in sec. 30, T. 22 S., R. 13 W. The site is about 7 miles southwest of the Drach pool, in relatively unexplored territory. The Stone Corral dolomite was found relatively high at a depth of 786 feet, 1,130 feet above sea level. The basal conglomerate of the Pennsylvanian system, the Sooy, was reached at 3,740 feet and was found to be resting directly on the Viola limestone of Ordovician age at 3,783 feet. The Simpson formation was reached at 3,835 feet and the Arbuckle dolomite at 3,893 feet, but it was barren and the well was therefore abandoned at 3,927 feet.

The Bradley Brothers No. 1 Davis well, in sec. 32, T. 23 S., R. 12 W., 2 miles southwest of the new Bedford pool, found the conglomerate at a depth of 3,760 feet and the Viola limestone at 3,799 feet. The Arbuckle dolomite was found at 3,972 feet and was dry. A well drilled 6 miles northwest of the Rattlesnake pool by Alfred Landon on the Coen lease also proved to be a failure. In this well the Arbuckle dolomite, found at 3,985 feet (2,048 feet below sea level), was dry, so the well was abandoned at 4,005 feet.

Oil Pools of Stafford County

Pool and Location	Area, acres	Cumulative production to end of 1940, bbls.	Number of wells	Producing zone	Depth in feet
Bedford, 21–23–12W	200	7,800	5	Arbuckle	3,859
Bonham, 28–25–12W	.....	.....	.....	Arbuckle	4,210
Drach, 12–22–13W	800	211,100	9	Arbuckle	3,693
Fischer, 31–21–12W	120	74,650	5	Arbuckle	3,641
Gates, 27–21–13W	640	579,000	11	Arbuckle	3,679
Jordan, 15–25–14W	200	163,800	5	Lans.-K. C.	3,722
Kipp, 27–25–14W	160	81,100	4	Lans.-K. C.	.....
Leesburgh, 12–25–13W	360	151,700	9	Arbuckle	4,153
Max, 35–21–12W	160	51,400	1	Lans.-K. C.	3,356
			5	Arbuckle	3,570
Mueller, 29–21–12W	80	87,660	2	Arbuckle	3,594
Rattlesnake, 13–24–14W	40	19,700	1	Lans.-K. C.	3,608
Richardson, 36–22–12W	1,200	3,863,500	60	Arbuckle	3,537
Riley, 28–23–11W	40	2,200	1	Lans.-K. C.	3,471
Roach, 12–22–14W	40	none	1	Arbuckle	3,749
St. John, 23–24–13W	1,200	703,500	20	Lans.-K. C.	3,588
				Arbuckle	4,075
Sittner, 33–21–12W	600	139,722	2	Lans.-K. C.	3,278
			3	Arbuckle	3,600
Sittner South, 3–22–12W	500	151,800	18	Arbuckle	3,594
Snider, 3–21–11W	320	170,800	4	Lans.-K. C.	.....
			1	Simpson	3,324
			3	Arbuckle	3,362
Snider South, 16–21–11W	360	50,700	8	Arbuckle	3,402
Stafford, 15–24–12W	160	18,900	4	Viola	3,836
Zenith, 23–24–11W	6,400	3,517,100	249	Misener	3,804
				Viola	.....

SOUTHWEST KANSAS

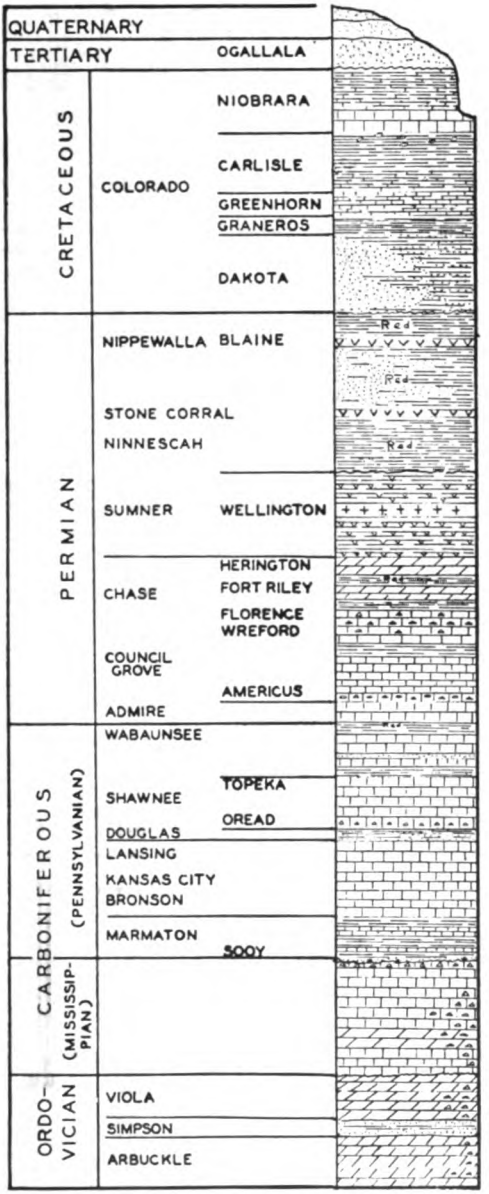

FIG. 37. Columnar section of rocks in southwestern Kansas.

Stevens County

The geology of Stevens county was described in Mineral Resources Circular 10, and the history of the Hugoton gas field to the end of 1937 was reviewed. In 1940, six wells were drilled in Stevens county in this large gas reserve, two in Haskell county, and one in Morton county. A generalized section of the rocks penetrated in southwestern Kansas is shown in figure 37. A map of the proved gas-producing area (shaded) is given in figure 38. Most of these wells

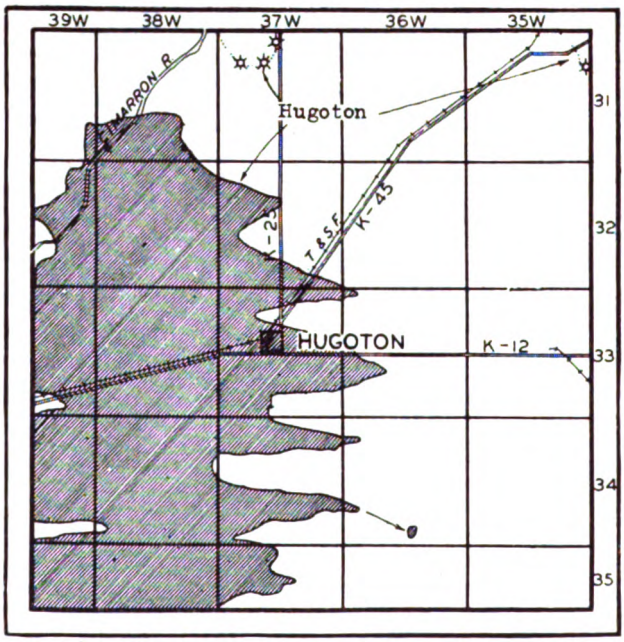

Fig. 38. Map of Stevens county showing proved gas-producing area.

were drilled deep enough to test adequately the gas-producing possibilities of the Wreford cherty limestone. The base of this limestone lies at depths averaging 2,850 feet. Some of the wells produced a large amount of gas from the upper part of the Fort Riley limestone at a depth of about 2,600 feet. A few wells were drilled to the base of the Wreford limestone and then plugged back to the Fort Riley limestone. A list of wells in the field completed in 1940 follows:

At the end of 1940 the Hugoton field included approximately 2,000,000 acres. In the Kansas portion of the area there were 283

wells, of which 19 were not provided with pipeline connections and therefore were not producing. For September, 1940, the allowable for the whole field was 21,639,000 cubic feet per day. The production for 1940 was 33,126,801,000 cubic feet, and the cumulative total reached 222,964,000,000 cubic feet.

Wells completed in 1940 in the Hugoton gas field

Name and Location	Open-flow capacity, M cu. ft.	Depth in feet
Stevens county:		
Stevens County O. & G. No. 1 Leonard, 3-32-38W. .	21,000	2,630
Stevens County O. & G. No. 1 McClure, 16-32-38W	21,000	2,630
Panhandle Eastern No. 1 Sharp, 36-32-39W.....	12,500	2,573
Orville Parker No. 1 Crawford, 30-33-37W.....	12,000	2,812
United Producing No. 1 Miller, 24-33-39W.....	15,687	2,626
Republic Nat. Gas No. 2 Parker, 31-34-36W.....	6,400	2,820
Haskell county:		
United Producing No. 1 Harper, 32-29-34W.....	6,000	2,715
United Carbon No. 1 Rooney, 5-30-34W.....	9,241	2,748
Morton county:		
Kuhn Bros. No. 1 Light, 33-33-39W.....	7,000	2,752

Sumner County

In 1940 only five wells were drilled in Sumner county. Of these, four were oil wells and one was a dry hole. In several oil pools some wells were abandoned, as at Oxford, Oxford West, and Padgett.

Latta Pool.—In 1940 the Latta pool produced 20,000 barrels of oil, increasing the cumulative total to 62,250 barrels.

Exploratory Wells.—One important dry hole was drilled 0.5 mile east of the producing well in the Zyba pool. It was the Hawkeye Oil Company No. 1 Carter well. The Mississippian limestone was found at a depth of 3,405 feet, the Kinderhook shale at 3,800 feet, the Simpson formation at 3,850 feet, and the Arbuckle dolomite at 3,927 feet. Although the Simpson sand, which produces in the Zyba pool, was found 16 feet higher than in the discovery well, it was dry, so the well was drilled down to the Arbuckle, which was dry also.

Oil and Gas Pools of Sumner County

Pool and Location	Area, acres	Cumulative production to end of 1940, bbls.	Number of wells	Producing zone	Depth in feet
Anness, 2–30–4E	40	36,700	1	Simpson	4,394
Caldwell, 17–35–3W	160	1,817,950	4	Simpson	4,765
Churchill, 25–31–2E	1,000	18,321,600	63	Stalnaker	1,820
Latta, 9–30–2W	200	62,250	11	Lans.-K. C.	3,042
				Lans.-K. C.	3,200
Oxford, 23–32–2E	800	14,283,200	13	Stalnaker	2,020
			6	Layton	.....
			21	Arbuckle	2,890
Oxford West, 17–32–2E	160	488,400	3	Arbuckle	.....
Padgett, 23–34–2E	1,800	1,903,700	20	Mississippi lime	3,474
Rutter, 21–33–2E	40	46,425	1	Mississippi lime	3,315
Vernon North, 15–35–2E	200	217,150	5	Mississippi lime	3,443
Wellington, 33–31–1W	1,200	4,483,100	98	"Chat"	3,655
Zyba, 7–30–1E	40	11,800	1	Simpson	3,866
Wellington (gas), 33–31–1W	1,200	.....	47	"Chat"	3,655
Padgett (gas)	1,000	.....	.....	.....	.....

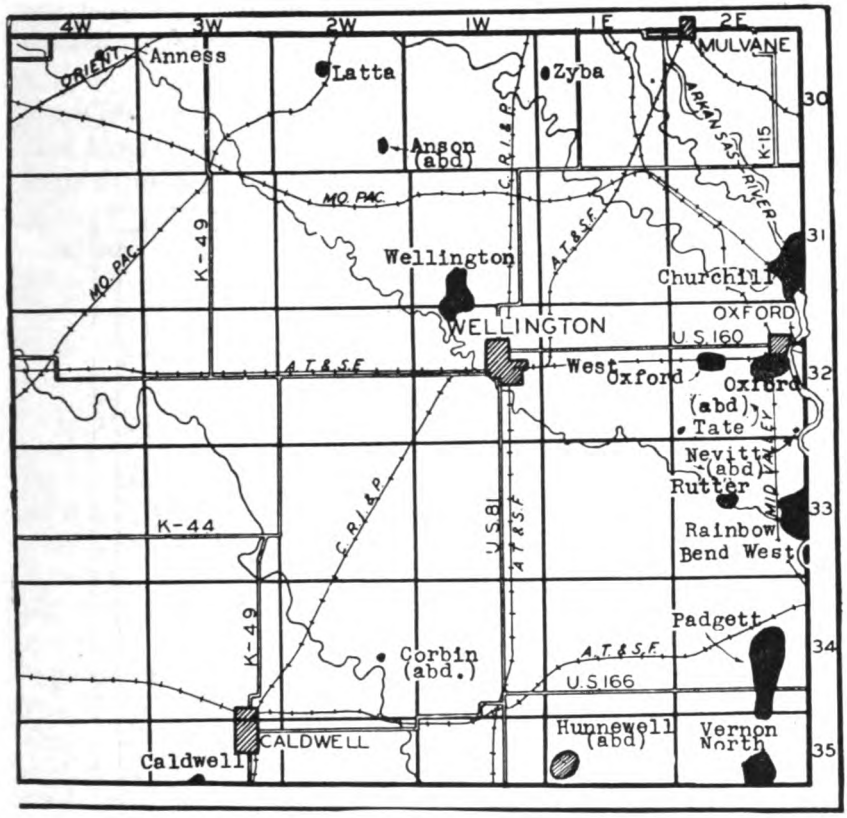

FIG. 39. Map of Sumner county showing oil and gas pools. Oil pools shown by solid black, gas pools by oblique lines.

TREGO COUNTY

The location of oil-producing areas in Trego county is shown in figure 40. For a description of the geology of the county the reader is referred to Mineral Resources Circulars 10 and 13. In 1940 no new oil wells were drilled, but four wildcat wells were completed.

Gugler Pool.—In 1940 one dry hole was drilled east of the Gugler pool in section 36. It was the No. 2 well of the York State Oil Company. The Arbuckle dolomite was barren and the well was abandoned at a depth of 3,893 feet.

Wakeeney Pool.—No wells were added in 1940. One of the old wells in this pool, the No. 1 Hamilton well in sec. 14, T. 11 S., R. 23 W., was deepened from a depth of 3,587 feet to a depth of 4,074 feet, and a new potential capacity of 10 barrels of oil and 190 barrels

of water was established. In 1940 the yield from this pool was 43,625 barrels. The cumulative total to the end of 1940 is 384,400 barrels.

Exploratory Wells.—One very interesting test well was drilled in Trego county in 1940. This is the Bartlett No. 1 Phannenstiel well, in sec. 30, T. 13 S., R. 25 W. According to the well cuttings received

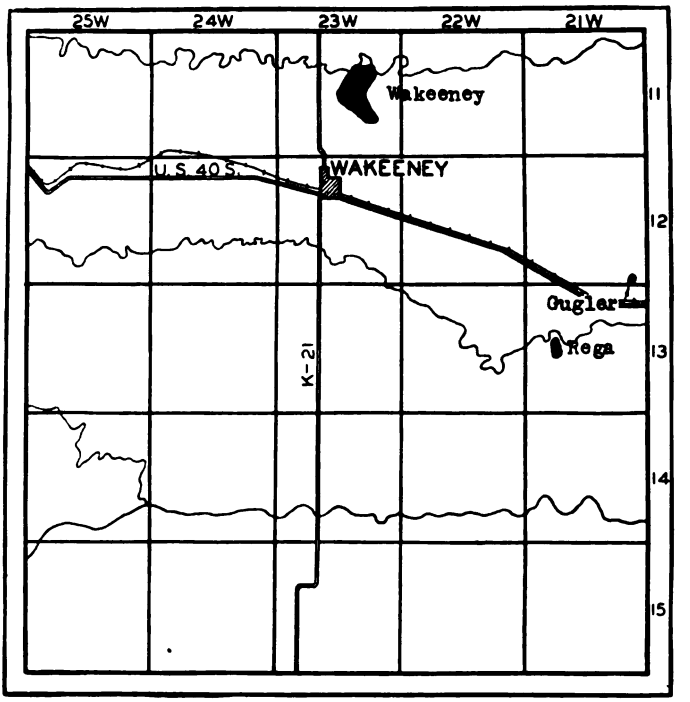

FIG. 40. Map of Trego county showing oil pools.

during drilling operations the Lansing limestone was reached at a depth of 3,690 feet, the Marmaton shales at 3,980 feet, the Mississippian limestone at 4,288 feet, and the Arbuckle dolomite at 4,650 feet. The well was abandoned at 4,684 feet.

Oil Pools of Trego County

POOL AND LOCATION	Area, acres	Cumulative production to end of 1940, bbls.	Number of wells	Producing zone	Depth in feet
Gugler, 36-12-21W.....	40	18,325	1	Arbuckle...	3,830
Wakeeney, 14-11-23W...	640	384,400	7	Lans.-K. C.	3,619

IMPORTANT WILDCAT WELLS

In 1940 the number of wildcat test wells drilled in the state of Kansas was 231. One third of these, 57, were drilled in the eastern part of the state, *i. e.*, in the eastern ranges, and of these, 40 were rank wildcats, being located 2 miles or farther from the nearest pool. Five of these found oil or gas and the other 35 were failures.

In western Kansas 174 wells may be classified as wildcat wells, inasmuch as they are located at least 0.5 mile from producing wells. Of these, 56 were oil wells and 2 were gas wells. The number of rank wildcat wells in western Kansas was 76, of which number only 11 were successful in finding new oil pools.

Most of the wildcat wells were drilled in those counties that already produced oil or gas. Such test wells have been described on previous pages. The most interesting one from the standpoint of geology and also possible expansion of oil-bearing area, was the well drilled by the Stanolind Oil Company on the Judd ranch in Kearny county. Located in the center of a large, relatively unexplored region, it was drilled on the basis of favorable preliminary geological investigation involving seismograph work, and core-drill exploration. The Dakota sandstone was found at a depth of 530 feet, the Topeka limestone, in the Pennsylvanian system, at 3,665 feet, the Lansing limestone at 4,060 feet, and the Mississippian system at 4,811 feet. Below the Mississippian the Ordovician Viola limestone was found at 5,425 feet, and the Arbuckle dolomite at 5,555 feet. The well was drilled down another 116 feet into pre-Cambrian rocks that were entered at 6,065 feet. In this well there were numerous good shows of oil in the Pennsylvanian system. They were particularly promising in some of the porous zones of the Lansing-Kansas City limestones.

In Cloud county another wildcat well far from any producing area was drilled by the Bells Wells Oil Company on the LeBlanc farm, in the NW¼ sec. 35, T. 6 S., R. 1 W. The important reference horizon at the top of the Ft. Riley limestone was found at a depth of 640 feet, the Topeka limestone at 1,660 feet, the Lansing limestone at 1,980 feet, and the Mississippian at 2,530 feet. The Siluro-Devonian limestone ("Hunton") was found at 2,785 feet, the top of the Ordovician shale at 3,005 feet, the Viola limestone at 3,090 feet, the Simpson formation at 3,325 feet, and the Arbuckle dolomite at 3,375 feet. The well was abandoned at a depth of 3,407 feet.

In Edwards county a wildcat well was drilled north of the abandoned McCarty pool. It is the McKnab No. 1 Minet Estate well in sec. 15, T. 25 S., R. 17 W., a farmout from the Amerada Oil Company. In this well the "Cimarron anhydrite" (Stone Corral) was entered at a depth of 1,175 feet, and the Ft. Riley limestone at 2,410 feet. The two reference horizons in the Pennsylvanian, the top of the Topeka and the top of the Lansing, were found at 3,470 feet and 3,983 feet respectively. The top of the Mississippian rocks was reached at 4,499 feet, thickness of Mississippian limestone being only 44 feet and that of the Chattanooga shale only 32 feet. The Misener sandstone was reached at 4,575 feet. The Ordovician Viola limestone was found at 4,597 feet, the Simpson formation at 4,806 feet, and the Arbuckle dolomite at 4,884 feet. A Schlumberger test failed to show any considerable quantities of oil or gas and therefore the well was abandoned at a total depth of 5,012 feet.

In Gove county a test well completed in February affected a large area in western Kansas. This well was located on the basis of excellent geological premises. The Dakota sandstone was found at a depth of 980 feet, the Stone Corral dolomite at 2,220 feet, the Topeka and the Lansing limestones at 3,720 feet and at 3,990 feet respectively, the Mississippian strata at 4,410 feet, the Ordovician Viola limestone at 4,555 feet, the Arbuckle dolomite at 4,615 feet, the Lamotte sandstone at 5,125 feet, and pre-Cambrian strata at 5,161 feet. The well was abandoned at a depth of 5,169 feet.

In Ness county a very significant well was drilled by the Aladdin Petroleum Company on the Jedlicka farm in sec. 33, T. 20 S., R. 23 W. The details have been given on page 55 under Ness county.

In Saline county, where some oil was found years ago in the Olsson pool, an incomplete test well was drilled in sec. 30, T. 16 S., R. 1 W., about 12 miles east of the Olsson pool. It was abandoned at a depth of 2,738 feet, still in the Mississippian strata. The Lansing limestone was found at 2,102 feet, and the top of the Mississippian limestone at 2,708 feet.

INDEX

18-8766