State Geological Survey of Kansas, Bulletin 130
1958 Reports of Studies, Part 6, Pages 193-242, Figures 1-3
December 31, 1958

THE MINERAL INDUSTRY IN KANSAS IN 1957

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ABSTRACT

In 1957, for the second consecutive year, the value of Kansas mineral production exceeded $500,000,000. Minerals produced in the state were valued at $534,093,085, or approximately $19,222,000 more than in 1956, a gain of 3.7 percent. Of this total, $467,151,147 or 87.5 percent was derived from sale of mineral fuels and associated products, $62,945,148 or 11.6 percent was contributed by the nonmetals excluding mineral fuels; and $4,896,790 or 0.9 percent by the metals. Only natural gas and hydrocarbon liquids were produced in greater quantity in 1957 than in the previous year. Crude oil, raw clay, natural gas, natural gas liquids, and common salt were worth more, however, than in 1956.

Only 3 of the 105 counties in Kansas reported no mineral production in 1957. Oil, gas, or both were produced in 80 counties, sand and gravel in 70 counties, and stone in 43 counties. In 1957, each of 54 counties produced minerals worth $1,000,000 or more. As in previous years, Barton County, with a production value of $41,345,547, continued to lead all others. Ellis County, with $36,178,679, was second, and Russell County, with $28,573,560, was third. Only seven of the counties producing $1,000,000 or more in mineral wealth in 1957 produced mainly nonfuel minerals, and six of these are in eastern Kansas. The counties that produced the greatest dollar value of minerals are those in which oil is found, mainly western Kansas counties. Counties that exploited the most different minerals were Cherokee, Rush, and Sedgwick. Most important minerals produced in Kansas were oil, natural gas, cement, natural gas liquids, stone, clay and clay products, salt, sand and gravel, carbon black, zinc, coal, and lead. This report gives the production and value of all minerals produced in the state in 1957 and compares them with 1956, and it also includes directories of mineral producers on record as of December 31, 1957.

INTRODUCTION

In 1957, for the second successive year, mineral production in Kansas exceeded $500,000,000. Total value of all minerals produced in the state in 1957 was $534,093,085, or $19,192,989 more than in 1956, a gain of 3.7 percent. Since 1932 Kansas has ranked among the first 10 states in the value of mineral commodities produced annually. Within the state 22 minerals are produced commercially; 5 others are available but currently are not exploited, at least 6 others are known to occur but have not been studied sufficiently to determine their commercial possibilities; at least 2 minerals are processed into useful mineral commodities from raw materials shipped into the state from outside sources. Table 1 presents data on mineral production in Kansas for 1956 and 1957, together with the rank of each mineral with respect to the other minerals produced in the state.

TABLE 1.—*Quantity and value of Kansas mineral production, by commodities, 1956 and 1957*

Commodity	Unit	1956 Quantity	1956 Value	1957 Quantity	1957 Value	Rank, 1957
Carbon black	Pound	105,680,834	$ 6,590,834	76,419,500	$ 5,131,569	9
Cement (masonry)	376-lb. bbl.	358,739	1,324,928	313,706	1,221,292	15
Cement (natural)	do	*	*	*	*	20
Cement (portland)	do	10,239,578	29,370,845	7,863,624	23,593,482	3
Clay (raw)	Short ton	977,099	1,169,048	908,693	1,239,789	14
Clay and clay products	do	....	10,000,000	....	10,000,000	5
Coal	do	876,006	4,003,500	754,439	3,470,419	11
Diatomaceous marl	do	*	*	*	*	23
Gypsum (crude)	do	*	*	*	*	17
Helium—shipments	Cu. ft.	45,035,200	698,000	36,743,000	569,517	18
Lead (recoverable content of ores)	Short ton	7,635	2,397,390	4,257	1,217,502	15
Natural gas	M cu. ft.	525,931,757	57,852,493	580,698,954	63,876,885	2
Natural gas liquids						
Butane	42-gal. bbl.	791,832	1,979,580	1,004,614	2,461,304	13
Natural gasoline	do	2,550,686	6,376,715	2,820,738	7,108,260	7
LPG	do	276,110	690,275	296,131	728,482	16
Propane	do	1,128,619	2,821,548	1,202,764	2,958,799	12
Perlite[a]	Short ton	*	*	*	*	21
Petroleum (crude)	42-gal. bbl	124,467,613	350,998,951	124,054,043	380,845,912	1
Pumicite (volcanic ash)	Short ton	*	*	*	*	25
Salt (brine)	do	*	*	*	*	19
Salt (common)	do	1,004,042	9,167,364	1,018,027	10,353,119	6
Sand and gravel	do	12,515,164	8,022,312	9,334,908	6,174,757	8
Sandstone (dimension)	do	*	*	*	*	24
Stone (limestone, sandstone, chat)	do	13,421,077	13,421,189	10,411,500[c]	11,926,238[c]	4
Vermiculite[a]	do	*	*	*	*	22
Zinc (recoverable content of ores, etc.)	do	28,665	7,854,210	15,859	3,679,288	10
*Undistributed			1,694,516		1,300,691	
Total value			$514,870,177[b]		$536,093,085[b]	

[a] Minerals processed but not mined in Kansas.
[b] Totals adjusted to eliminate duplication in the value of clays and stone.
[c] Excludes sandstone, value of which is included under "Undistributed".
* Quantity and value of individual commodities cannot be revealed.

Minerals are widely distributed in the state; oil, gas, or both were produced in 80 counties, one more than in the previous year, Wichita County being added to the list; sand and gravel were produced in 70 counties instead of 67 as in 1956, and stone in 43 counties instead of 41 as in 1956. Coal is currently being mined only in 8 eastern counties, although in former years 22 other eastern counties and 10 north-central counties reported the mining of coal. Salt and gypsum known to underlie at least 40 central and southwestern counties are currently being produced in only 6 counties.

Of the 105 counties in Kansas, all but 3 (Greeley, Lane, and Mitchell) reported mineral production in 1957—the same as in 1956. In 1957, each of 54 counties, one fewer than in 1956, produced minerals worth $1,000,000 or more. Barton County, which produced minerals valued at $41,345,547, continued to lead. Ellis County ($36,178,679) was second, as in the previous year. Russell County ($28,573,560) again was third, and was followed by Butler ($24,857,151), Rooks ($22,140,843), Greenwood ($21,472,020), and Graham ($20,719,447) in the $20,000,000 to $30,000,000 category. Counties each of which produced in 1957 mineral wealth valued between $10,000,000 and $20,000,000 were Grant, Rice, Stafford, Cowley, Sedgwick, Barber, McPherson, Morton, Stevens, Allen, and Pawnee. Table 2 summarizes the range of value of the 1956 and 1957 mineral production per county.

The counties that produced the greatest dollar value of minerals ($10,000,000 or more) are those in which oil is found. Most of these are western counties, but Allen, Butler, Cowley, and Greenwood, all eastern counties, are included. Seven of the 54 counties producing $1,000,000 or more in mineral wealth in 1957 produced mainly nonfuel minerals, and 6 of these are eastern

TABLE 2.—*Range of value of 1956 and 1957 mineral production per county*

Value of annual production, millions of dollars	Number of counties producing minerals valued in this range	
	1956	1957
40-50	1	1
30-40	1	1
20-30	3	4
10-20	13	12
1-10	37	36
0-1	47	48
no production	3	3

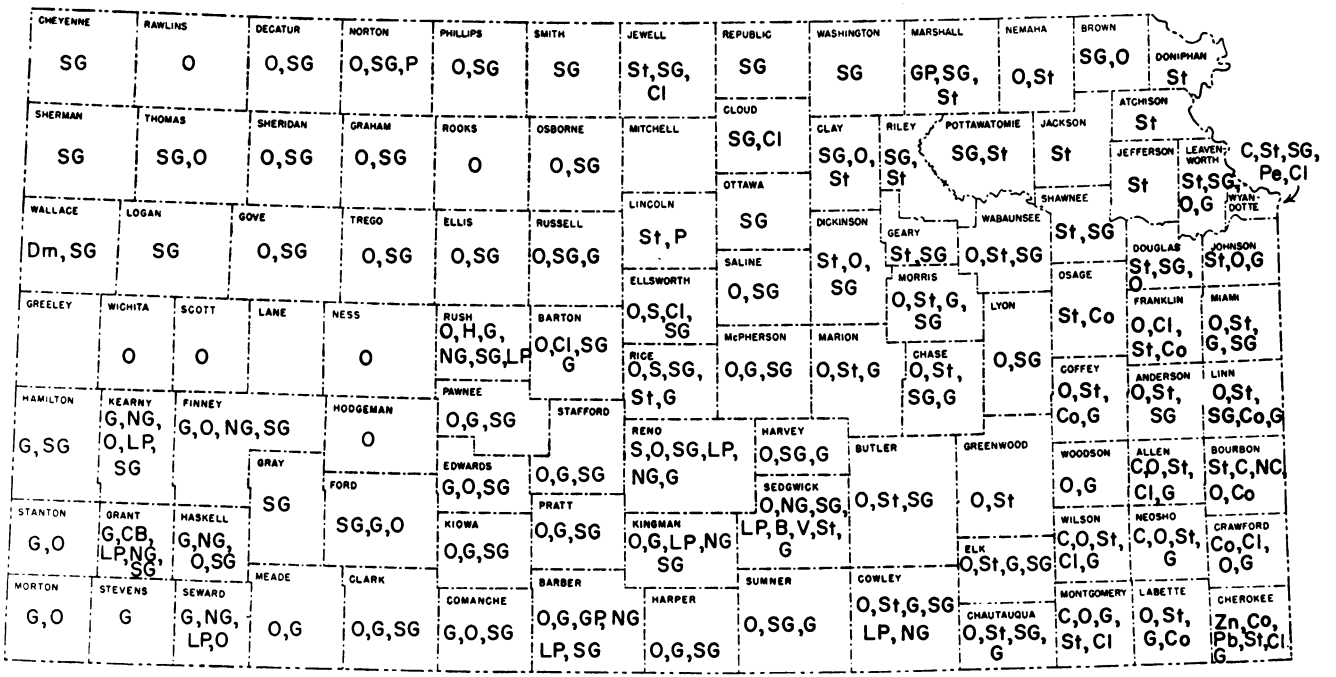

FIG. 1.—Map of Kansas showing mineral commodities produced in each county in 1957. Minerals are listed in order of value within counties. **B**—brine. **C**—cement. **CB**—carbon black. **Cl**—clay. **Co**—coal. **Dm**—diatomaceous marl. **G**—natural gas. **GP**—gypsum. **H**—helium. **LP**—liquefied petroleum gases. **NC**—natural cement. **NG**—natural gasoline. **O**—oil. **P**—pumicite or volcanic ash. **Pb**—lead. **Pe**—perlite. **S**—salt. **SG**—sand and gravel. **St**—stone. **V**—vermiculite. **Zn**—zinc.

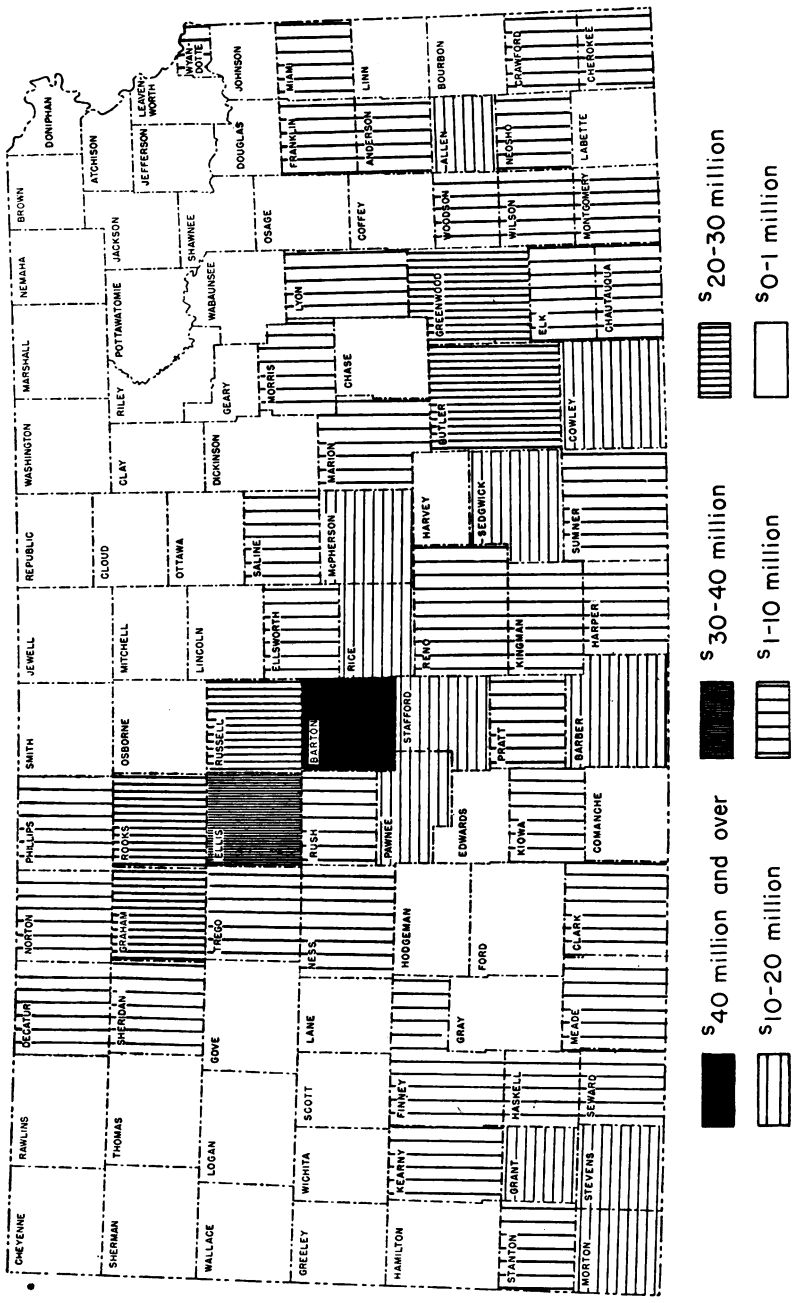

FIG. 2.— Map of Kansas showing range of value of 1957 mineral production per county.

counties, Allen, Cherokee, Montgomery, Neosho, Wilson, and Wyandotte; Reno is the only western county. Elk County's mineral wealth is about equally divided between fuel and nonfuel minerals. Counties that exploited the most different minerals were Cherokee, Rush, and Sedgwick; of these, only Cherokee produced no oil (Fig. 1). A summary evaluation of mineral fuels and nonfuel minerals for Kansas counties in 1957 is presented in Table 3 and Fig. 2.

Sources of information.—Much of the information compiled in this report was obtained from the tabulation sheets provided by the United States Bureau of Mines, with which the State Geological Survey of Kansas has been cooperating for many years in collecting mineral statistics for the state. Coal statistics were derived from the reports of Mr. John Delplace, Chief Mine Inspector of the Mine Inspection Section and Mine Rescue Station

TABLE 3.—*Value of mineral production in Kansas by counties in 1957*

County	Value of mineral production			Commodities[b] in order of decreasing importance
	Fuels[a]	Nonfuels	Total	
Allen	$ 2,988,339	$ 7,882,645	$ 10,870,984	C, O, St, Cl, G
Anderson	1,752,602	178,700	1,931,302	O, St, SG
Atchison	....	187,168	187,168	St
Barber	12,834,544	258,647	13,093,191	O, G, Gp, NG, LP, SG
Barton	40,948,228	397,319	41,345,547	O, Cl, SG, G
Bourbon	125,805	660,481	786,286	St, C, NC, O, Co
Brown	3,758	5,150	8,908	SG, O
Butler	24,741,609	115,542	24,857,151	O, St, SG
Chase	165,207	26,998	192,205	O, St, SG, G
Chautauqua	2,980,840	123,100	3,103,940	O, St, SG, G
Cherokee	2,441,656	5,573,734	8,015,390	Zn, Co, Pb, St, Cl, G
Cheyenne	....	13,250	13,250	SG
Clark	1,326,331	5,733	1,332,064	O, G, SG
Clay	30,875	41,828	72,703	SG, O, St
Cloud	....	365,666	365,666	SG, Cl
Coffey	441,695	71,766	513,461	O, St, Co, G
Comanche	29,749	5,959	35,708	G, O, SG
Cowley	13,297,526	547,048	13,844,574	O, St, G, SG, LP, NG
Crawford	1,102,464	176,839	1,279,303	Co, Cl, O, G
Decatur	1,459,737	3,265	1,463,002	O, SG
Dickinson	315,470	449,438	764,908	St, O, SG
Doniphan	....	310,585	310,585	St
Douglas	26,120	*	*	St, SG, O
Edwards	369,279	*	*	G, O, SG
Elk	890,164	731,951	1,622,115	O, St, G, SG
Ellis	36,174,304	4,375	36,178,679	O, SG
Ellsworth	7,957,053	1,021,534	8,978,587	O, S, Cl, SG
Finney	6,121,386	107,789	6,229,175	G, O, NG, SG
Ford	59,016	153,825	212,841	SG, G, O
Franklin	942,350	153,629	1,095,979	O, Cl, St, Co
Geary	....	359,200	359,200	St, SG

County	Value of mineral production			Commodities[b] in order of decreasing importance
	Fuels[a]	Nonfuels	Total	
Gove	65,996	4,612	70,608	O, SG
Graham	20,656,547	62,900	20,719,447	O, SG
Grant	18,888,085	*	*	G, CB, LP, NG, SG
Gray	....	*	*	SG
Greeley	....	....	....	None reported
Greenwood	21,422,420	49,600	21,472,020	O, St
Hamilton	442,544	15,704	458,248	G, SG
Harper	2,625,639	8,406	2,634,045	O, G, SG
Harvey	738,548	*	*	O, SG, G
Haskell	4,607,355	167	4,607,522	G, NG, O, SG
Hodgeman	524,346	....	524,346	O
Jackson	....	68,334	68,334	St
Jefferson	....	474,000	474,000	St
Jewell	....	501,767	501,767	St, SG, Cl
Johnson	19,952	253,864	273,816	St, O, G
Kearny	7,665,435	39,932	7,705,367	G, NG, O, LP, SG
Kingman	9,745,411	*	*	O, G, LP, NG, SG
Kiowa	3,020,764	24,700	3,045,464	O, G, SG
Labette	396,978	63,980	460,958	O, St, G, Co
Lane	....	....	....	None reported
Leavenworth	23,800	449,215	473,015	St, SG, O, G
Lincoln	....	*	*	St, P
Linn	258,108	114,008	372,116	O, St, SG, Co, G
Logan	....	2,400	2,400	SG
Lyon	826,819	179,590	1,006,409	O, SG
Marion	6,692,854	255,393	6,948,247	O, St, G
Marshall	....	574,010	574,010	Gp, SG, St
McPherson	12,802,382	3,308	12,805,690	O, G, SG
Meade	3,890,433	....	3,890,433	O, G
Miami	1,852,371	189,700	2,042,071	O, St, G, SG
Mitchell	....	....	....	None reported
Montgomery	1,879,585	4,745,690	6,625,275	C, O, G, St, Cl
Morris	1,113,112	73,718	1,186,830	O, St, G, SG
Morton	12,066,113	....	12,066,113	G, O
Nemaha	54,729	13,020	67,749	O, St
Neosho	1,885,921	4,782,978	6,668,899	C, O, St, G
Ness	1,661,447	....	1,661,447	O
Norton	2,787,710	50,731	2,838,441	O, SG, P
Osage	28,805	82,500	111,305	St, Co
Osborne	233,621	12,760	246,381	O, SG
Ottawa	....	17,429	17,429	SG
Pawnee	10,103,033	61,166	10,164,199	O, G, SG
Phillips	6,070,389	106,408	6,176,797	O, SG
Pottawatomie	....	103,297	103,297	SG, St
Pratt	7,241,934	29,093	7,271,027	O, G, SG
Rawlins	12,335	....	12,335	O
Reno	2,791,202	7,145,738	9,936,940	S, O, SG, LP, NG, G
Republic	....	67,611	67,611	SG
Rice	16,513,532	2,166,998	18,680,530	O, S. SG, St, G
Riley	....	100,172	100,172	SG, St
Rooks	22,140,843	....	22,140,843	O
Rush	2,951,976	14,254	2,966,230	O, H, G, NG, SG, LP
Russell	28,554,660	18,900	28,573,560	O, SG, G
Saline	1,991,104	244,057	2,235,161	O, SG
Scott	111,288	....	111,288	O

County	Value of mineral production			Commodities[b] in order of decreasing importance
	Fuels[a]	Nonfuels	Total	
Sedgwick	12,020,248	1,670,652	13,690,900	O, NG, SG, LP, B, V, St, G
Seward	5,597,023	....	5,597,023	G, NG, LP,O
Shawnee	....	981,544	981,544	St, SG
Sheridan	1,244,012	5,848	1,229,860	O, SG
Sherman	....	*	*	SG
Smith	....	*	*	SG
Stafford	18,068,675	*	*	O, G, SG
Stanton	2,232,828	....	2,232,828	G, O
Stevens	11,646,104	....	11,646,104	G
Sumner	9,150,167	61,114	9,211,281	O, SG, G
Thomas	13,926	22,171	36,097	SG, O
Trego	5,917,468	2,870	5,920,338	O, SG
Wabaunsee	910,838	*	*	O, St, SG
Wallace	....	*	*	Dm, SG
Washington	....	96,600	96,600	SG
Wichita	1,075	....	1,075	O
Wilson	602,653	4,810,523	5,413,176	C, O, St, Cl, G
Woodson	2,843,384	....	2,843,384	O, G
Wyandotte	....	6,204,782	6,204,782	C, St, SG, Pe, Cl
Unassigned	....	9,249,566	9,249,566	Cl prod., SG, St
Undistributed	....	691,595	691,595	
Kansas total	467,151,147[c]	66,941,938	534,093,085[c]	

* Undistributed values may not be revealed.

[a] The value of oil (fuels column) was computed on the average price of $3.07 per barrel (Table 1), even though it is realized that the price of oil varies with the gravity and that therefore the actual value of oil in any county may be greater or less than that computed. Likewise, the new minimum price of 11 cents per 1000 cubic feet of natural gas measured at 14.65 psia (pounds per square inch absolute) established by the Kansas Corporation Commission for the Hugoton Gas Area has been applied to all Kansas gas production, including minor amounts of unprorated production, much of which probably brought a higher price.

[b] Commodities: B, brine; C, cement; CB, carbon black; Cl, clay; Co, coal; Dm, diatomaceous marl; G, natural gas; Gp, gypsum; H, helium; LP, liquefied petroleum gases; NC, natural cement; NG, natural gasoline; O, oil; P, pumicite (volcanic ash); Pb, lead; Pe, perlite; S, salt; SG, sand and gravel; St, stone; V, vermiculite; Zn, zinc.

[c] Adjusted to eliminate duplication in value of oil.

of the Kansas Labor Department at Pittsburg, Kansas. Data pertaining to petroleum and related products and natural gas were summarized from reports by Goebel and others on oil and gas developments in Kansas published as State Geological Survey Bulletins 128 and 133. Many of the data on oil and gas production in these bulletins were supplied by the Kansas Corporation Commission, Conservation Division. Other data (regarding expansion, modernization, and organization of new mineral producing companies) were obtained from *Midwest Industry Magazine* and *Kansas!* (formerly *To The Stars*), the latter a publication of the Kansas Industrial Development Commission, Topeka.

THE MINERAL FUELS AND RELATED PRODUCTS

The mineral fuels—coal, oil, natural gas, the natural gas liquids, and related products (helium and carbon black)—contributed, as in former years, the greatest share to the mineral wealth produced in Kansas. In 1957 they accounted for 87.5 percent of the total value ($467,151,147) as compared to 83.9 percent ($432,001,725) in 1956 (Table 4, Fig. 3).

Coal

Coal production in Kansas in 1957 was 754,439 tons, 121,567 tons less than in 1956 or a decrease of 13.9 percent. The 1957 value amounted to $3,470,419 as compared to $4,003,500 in 1956, a decrease of 13.4 percent. The estimated average price per ton in 1957 was $4.60, or 4 cents more than in 1956. Coal ranked 11th in value among mineral commodities produced in Kansas. Of the total quantity of coal mined in the state, 743,816 tons (98.5 percent) was mined by stripping and only 10,623 tons (1.5 percent) from shaft mines. In 1957, 32 coal mining companies operated a total of 34 mines in the state, of which 30 were strip mines and 4 shaft mines. The eight Kansas coal producing counties, Bourbon, Cherokee, Coffey, Crawford, Franklin, Labette, Linn, and Osage, each produced less coal than in the previous year. Greatest decline (30.9 percent) was in Crawford County, where production was 92,767 tons less than in 1956, although in

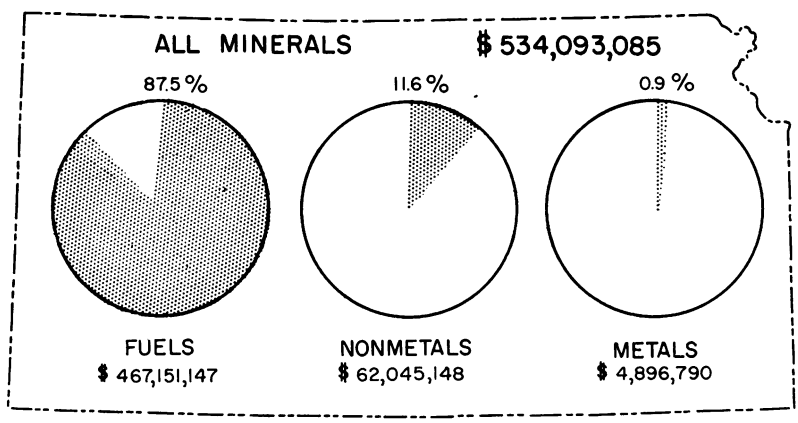

Fig. 3.—Percent and value of mineral production in Kansas, 1957.

TABLE 4.—*Value of minerals produced in Kansas in 1956 and 1957*

Year	Mineral fuels and associated products	Percent of total	Nonmetals (excluding mineral fuels)	Percent of total	Metals	Percent of total	All minerals
1956	$432,011,725	83.9	$72,606,852	14.1	$10,251,600	2.0	$514,870,177
1957	467,151,147	87.5	62,045,148	11.6	4,896,790	0.9	534,093,085

TABLE 5.—*Kansas coal production by type of mine and by county, value of coal, rank of counties, and number of mines, 1956 and 1957*

County	1956 Production, short tons			1956 Value	1957 Production, short tons			1957 Value	Rank		Number 1957	
	Strip	Deep	Total		Strip	Deep	Total		1956	1957	Strip	Deep
Bourbon	6,511	....	6,511	$ 29,755	5,642	....	5,642	$ 25,953	4	4	5	
Cherokee	557,489	....	557,489	2,547,725	530,731	....	530,731	2,441,363	1	1	5	
Coffey	2,712	....	2,712	12,394	2,445	....	2,445	11,247	5	5	2	
Crawford	293,947	7,128	301,075	1,375,913	201,750	6,558	208,308	958,217	2	2	12	2
Franklin	....	647	647	2,957	536	....	536	2,466	6	6	2	
Labette	....	447	447	2,043	111	....	111	511	7	8	1	
Linn	....	398	398	1,778	304	....	304	1,398	8	7	1	
Osage	2,199	4,537	6,736	30,784	2,197	4,065	6,262	28,805	3	3	2	2
All counties	862,858	13,148	876,006	4,003,500	743,816	10,623	754,439	3,470,419			30	4
Percent	98.5	1.5	100		98.5	1.5	100					
Percent change from 1956					—13.6	—19.2	—13.9	—13.4				

1956 it had shown a gain of 14.3 percent over 1955. Cherokee County in 1957 produced 530,731 tons, 70.3 percent of all coal mined in the state, hence ranked first as it did in 1955 and 1956. Crawford County ranked second, despite its sharp decrease, followed by Osage County as a poor third. Table 5 gives data on Kansas coal production by type of mine and by counties, value of coal, rank of counties, and number of mines in 1956 and 1957.

The Pittsburg-Midway Coal Company, operating in Cherokee County, produced 486,992 tons of coal in 1957, or 64.5 percent of all coal mined in the state. Second and third were the Clemens Coal Company (94,645 tons) and the Apex-Compton Coal Company (92,883 tons), both operating in Crawford County. These three companies produced a total of 674,520 tons or 89.4 percent of all coal mined in Kansas in 1957. Of the four coal companies pro-

TABLE 6.—*Directory of Kansas coal mining companies on record as of December 31, 1957*

County	Coal company	Office address
Bourbon	Percy Deer	Fulton
do	Garrett	Route 2, Garland
do	McNeil	Route 2, Fort Scott
do	Pellett	Route 5, Fort Scott
do	Wood	Route 1, Pleasanton
Cherokee	Black Diamond	Weir
do	Markley	Route 2, McCune
do	Pittsburg-Midway	314 Nat'l. Bank Bldg., Pittsburg
do	S&M	Route 1, Scammon
do	Wilkinson	Weir
Coffey	Rogers	Lebo
do	Thorne	P. O. Box 171, Lebo
Crawford	Apex-Compton	P. O. Box 45, Monmouth
do	Blue Ribbon	Girard
do	Carr	Route 1, Mulberry
do	Clemens	312 Globe Bldg., Pittsburg
do	Davis	Cherokee
do	Gobl	Route 1, Mulberry
do	Jones	Arcadia
do	Lucky Star	2024 S. Broadway, Pittsburg
do	Mark	Route 1, Mulberry
do	N. Coal Co.	1010 S. Catalpa, Pittsburg
do	Palmer & Son	Mulberry
do	Julia Weir	Croweburg
do	Wilson	402 W. 20th, Pittsburg
Franklin	Red Star	Homewood
Labette	Gallagher	P. O. Box 65, Oswego
Linn	Fyock	Prescott
Osage	Bell	Burlingame
do	Central Coal & Mining Co.	Burlingame
do	Johnson	Scranton
do	Linville & Sons	P. O. Box 266, Carbondale

ducing coal by drift or shaft mining, the Blue Ribbon Coal Company of Crawford County (3,388 tons) ranked first, followed very closely by the Lucky Star Coal Company of Crawford County (3,170 tons) and the Bell Coal Company of Osage County (3,116 tons).

Measured and indicated coal reserves in Kansas at the end of 1957 are estimated at 1,117,000,000 tons, of which approximately 837,750,000 tons is believed to be recoverable coal.

The Pittsburg and Midway Coal Mining Company at Pittsburg, Crawford County, is building a new office building having 9,000 square feet of floor space, which will house the company's treasury, engineering, and production divisions.

Coal companies operating in Kansas on record December 31, 1957, are listed in Table 6.

Oil

In 1957 Kansas produced 124,054,043 barrels of crude oil valued at $380,845,912, a slight decrease (0.3 percent) in production but an 8.5 percent increase in value compared to 1956 (Table 7). As in former years, Kansas maintained fifth rank among the oil producing states, and oil ranked first among the mineral commodities produced in the state. Increase in the value of oil produced in 1957, despite a decrease in quantity compared to 1956, was due to a 25-cent increase in price—$3.07 per barrel as compared to $2.82 in 1956.

Table 7.—*Petroleum or crude oil production in Kansas, 1956 and 1957*

Year	Production, bbl.	Value	Price per bbl.
1956	124,467,713	$350,998,951	$2.82
1957	124,054,043	380,845,912	3.07
Percent change	—0.3	+8.5	

The number of counties actually reporting production was 75, the same as in 1956. Among the ten leading oil-producing counties, only one change in rank is to be noted (Table 8). Stafford County, which in 1956 ranked seventh in production, dropped to eighth position, exchanging places with Graham County. Of the ten leading oil-producing counties, Ellis, Graham, Greenwood, and Rooks showed increases in 1957 compared to 1956.

TABLE 8.—*Ten leading oil-producing counties in Kansas, 1956 and 1957*

County	Production, bbl.		Rank	
	1956	1957	1956	1957
Barton	14,413,934	13,318,331	1	1
Ellis	11,618,360	11,783,161	2	2
Russell	9,883,069	9,300,056	3	3
Butler	8,138,153	8,059,156	4	4
Rooks	6,988,701	7,212,001	5	5
Greenwood	6,788,601	6,977,957	6	6
Graham	6,040,225	6,728,517	8	7
Stafford	6,231,825	5,855,899	7	8
Rice	5,369,801	5,359,253	9	9
Cowley	4,595,480	4,182,037	10	10

Fourteen counties (Table 9) have each produced a cumulative quantity of 50 million barrels or more since production first started. Of these counties, Butler, an eastern Kansas county, ranks first, having produced 421,872,447 barrels, 112,638,027 barrels more than second-place Barton County and 133,345,341 barrels more than Russell County, third in rank. Greenwood County, which in 1956 ranked fifth, advanced to fourth, displacing Rice County.

Since records of oil production in the state have been kept, Kansas has produced, to the end of 1957, a recorded cumulative total of 2,890,939,000 barrels of crude oil valued at approximately $5,633,000,000.

Most of the larger oil fields are in western Kansas (Table 10).

TABLE 9.—*Leading oil-producing counties in Kansas based upon recorded and estimated cumulative production (50 million barrels or more) to the end of 1957*

County	Cumulative production, bbl.		Rank	
	1956	1957	1956	1957
Butler	413,813,291	421,872,447	1	1
Barton	295,916,089	309,234,420	2	2
Russell	279,226,050	288,526,106	3	3
Greenwood	209,597,693	216,575,650	5	4
Rice	210,515,444	215,874,697	4	5
Ellis	192,577,302	204,360,463	6	6
McPherson	136,435,169	140,584,533	7	7
Stafford	120,908,569	126,765,181	8	8
Cowley	88,134,198	92,316,235	9	9
Ellsworth	87,062,334	89,654,208	10	10
Rooks	67,069,840	74,281,841	11	11
Sumner	64,090,567	67,069,889	12	12
Sedgwick	61,324,314	64,496,251	13	13
Reno	61,137,234	61,930,531	14	14

TABLE 10.—*Leading oil fields in Kansas, 1956 and 1957*

Field	Rank	County	Annual production, barrels	
			1956	1957
Bemis-Shutts	1	Ellis	3,055,079	5,922,087
El Dorado	2	Butler	4,358,743	4,619,047
Chase-Silica	3	Rice, Barton, Stafford	3,482,134	4,271,122
Trapp	4	Russell-Barton	4,241,489	3,727,771
Hall-Gurney	5	Russell-Barton	3,598,344	3,542,500
Kraft-Prusa	6	Barton-Ellsworth	3,712,498	3,436,752

Of the six major oil fields, only the El Dorado field in Butler County lies east of the Sixth Principal Meridian, which is the division line between eastern and western Kansas insofar as oil and gas are concerned. Rating of the six leading oil fields changed notably in 1957 compared to 1956 (Table 10). In 1957, the Bemis-Shutts field, which in 1956 was sixth, surpassed the El Dorado field in Butler County as the leading oil field in Kansas. The El Dorado field was second, followed by Chase-Silica field in Rice, Barton, and Stafford Counties, which had been fifth in 1956. The Trapp field, in Russell and Barton Counties, ranked second in 1956, dropped to fourth in 1957. The Kraft-Prusa field, in Barton and Ellsworth Counties, and the Hall-Gurney field in Russell and Barton Counties, third and fourth respectively in 1956, ranked sixth and fifth in 1957. Production of these large oil fields for the years 1956 and 1957 is listed in Table 10.

In 1957, Kansas consumed 105,104,885 barrels of oil or 84.7 percent of its production. In 1956, consumption of oil in Kansas amounted to 80.4 percent of its production or 4.3 percent less than in 1957. Imports of oil in 1957 increased by 3,800,001 barrels (11 percent) whereas exports declined by 1,644,108 barrels (2.8 percent). Total quantity of oil accounted for in 1957 was 162,174,152 barrels compared to 158,787,821 barrels in 1956. Data on production, consumption, imports, and exports, and total

TABLE 11.—*Production, consumption, imports, and exports of crude oil in Kansas, 1956 and 1957*

Year	Production, bbl.	Consumption		Imports, bbl.	Exports, bbl.	Total quantity, production plus imports, bbl.
		Quantity, bbl.	Percent of production			
1956	124,467,713	100,074,446	80.4	34,320,108	58,713,375	158,787,821
1957	124,054,043	105,104,885	84.7	38,120,109	57,069,267	162,174,152

TABLE 12.—*Total crude oil reserves and oil fields discovered and revived in Kansas, 1956 and 1957*
(American Petroleum Institute, 1956 and 1957)

Year	Million bbl.	Percent change from 1956	Oil fields		Total
			discovered	revived	
1956	992.2		135[a]	5	140
1957	947.5	—4.5	154[b]	4	158

[a] Three fields produced both oil and gas.
[b] Five fields produced both oil and gas.

quantity of oil accounted for in 1956 and 1957 are listed in Table 11.

Crude oil reserves in 1957 are estimated at 947.5 million barrels or 4.5 percent less than in 1956, even though more oil fields were discovered in 1957 than in 1956 (Table 12). In 1957, 154 new oil fields were discovered, 5 of which produced both oil and gas. In addition, 4 abandoned oil fields were revived. Counties in which new oil fields were discovered in 1957 are listed in Table 13.

Magnolia Petroleum Company completed a natural gasoline plant near Attica in Harper County in February. This new plant, known as the company's Spivey Gasoline Plant, has a processing capacity of 55 million cubic feet of gas a day and was processing 30 million cubic feet of gas and extracting more than 21,000 gallons of natural gasoline and 26,000 gallons of butane and propane a day. Derby Refining Company of Wichita completed its Ultraformer platinum catalyst refining unit, the first refining unit of this type in Kansas. Vickers Petroleum Company, Incorporated, of Wichita was constructing a $2,000,000 V. O. P. extraction unit at its 18,000-bbl. refinery at Potwin in Butler County. This unit will yield annually 357,140 bbl. of chemicals consisting of aromatic hydrocarbons from a catalytic reformer. Anderson-Prichard Oil Corporation increased its crude oil capacity by 6,500 bbl. a day and its straight-run asphalt capacity by 250 bbl. a day at its Arkansas City refinery in Cowley County. Standard Oil Company of Indiana completed construction of a 6,000-bbl. Ultraformer and a 6,000-bbl. Hydrofining unit at its Neodesha refinery in Wilson County. The Century Refining Company refinery south of Scott City, Scott County, was purchased by the Panhandle Eastern Pipeline Company. Skelly Oil Company started constructing a 3,500-bbl. Phillips HF alkylation unit at its El Dorado refinery, and Socony Mobil Oil Company, Incorp-

TABLE 13.—*Counties and number of oil and gas fields discovered and number of revived fields in each in Kansas in 1957*

County	New			Revived		Total
	Oil	Gas	Oil and gas	Oil	Gas	
Barber	2	4	1	....	....	7
Barton	6	....	....	....	....	6
Butler	4	....	....	....	....	4
Chautauqua	1	....	....	....	....	1
Clark	....	1	....	....	....	1
Clay	1	....	....	....	....	1
Comanche	....	1	....	....	....	1
Cowley	9	....	1	....	....	10
Decatur	3	....	....	....	....	3
Edwards	2	3	....	....	....	5
Ellis	14	....	....	....	....	14
Finney	1	....	....	....	....	1
Graham	23	....	....	1	....	24
Greenwood	3	....	....	....	....	3
Hamilton	....	1	....	....	....	1
Harper	4	....	2	....	....	6
Harvey	2	....	....	....	....	2
Haskell	1	....	....	....	....	1
Hodgeman	2	....	....	....	....	2
Kearny	1	....	....	....	....	1
Kingman	3	1	....	....	....	4
Kiowa	....	3	1	....	....	4
Marion	6	....	....	....	....	6
Meade	3	1	....	....	....	4
Morris	1	....	....	....	....	1
Morton	2	3	....	....	....	5
Ness	2	....	....	....	....	2
Norton	1	....	....	....	....	1
Osborne	1	....	....	....	....	1
Pawnee	3	1	....	....	....	4
Pratt	4	....	....	....	....	4
Reno	3	....	....	....	....	3
Rice	3	....	....	1	1	5
Rooks	2	....	....	....	....	2
Rush	3	....	....	1	....	4
Russell	4	1	....	....	....	5
Scott	1	....	....	....	....	1
Sedgwick	5	....	....	....	....	5
Stafford	12	....	....	1	....	13
Stanton	....	1	....	....	....	1
Sumner	6	....	....	....	....	6
Trego	4	....	....	....	....	4
Wichita	1	....	....	....	....	1
Total	149	21	5	4	1	180

orated, completed a 9,000-bbl. catalytic reforming unit at Augusta in Butler County. The National Cooperative Refinery Association at McPherson, McPherson County, announced plans for an improvement and expansion project, estimated to cost more than $2,000,000, to revamp the entire crude unit, the present coker,

and gasoline blending facilities, and to enlarge the gasoline storage capacity of the plant. The Co-operative Refining Association at Phillipsburg, Phillips County, planned to install two major units at their plant, a platformer, which will make possible the production of 100-octane gasoline, and a unifiner, which will permit the upgrading of distillates.

Southern Kansas Pipeline Company planned an 8- to 12-inch crude oil pipeline from Liberal, Seward County, to Arkansas City, Cowley County. This pipeline, 240 miles long, would have an initial daily capacity of 10,000 bbl. of crude oil and an ultimate capacity of 20,000 bbl. The project is estimated to cost $10,000,000. Skelly Oil Company will build a booster station and a new 12-inch crude oil line to improve and enlarge its oil transmission system in central Kansas. The pipeline will extend approximately 50 miles from Cunningham, Kingman County, to Burrton, Harvey County. In addition, other pipelines have been laid in Barber and Johnson Counties.

Many major oil companies operate in Kansas, as do numerous independent oil companies and operators whose number

TABLE 14.—*Directory of petroleum refineries in Kansas as of December 31, 1957*

Refinery	Office Address	County
Anderson-Prichard Oil Corp.	Arkansas City	Cowley
Century Refining Company, Inc.[a]	114 W. Pine, Garden City	Finney
Chanute Refining Company	P.O. Box 431, Chanute	Neosho
Cooperative Refinery Assn.	Coffeyville	Montgomery
Cooperative Refinery Assn.	P.O. Box 570, Phillipsburg	Phillips
Derby Oil Company	420 W. Douglas, Wichita	Sedgwick
El Dorado Refining Company	P.O. Box 551, El Dorado	Butler
Mid-America Refining Company, Inc.	Chanute	Neosho
National Cooperative Refining Assn.	P.O. Box 770, McPherson	McPherson
Phillips Petroleum Company	2029 Fairfax Trafficway, Kansas City	Wyandotte
Skelly Oil Company	1401 S. Douglas Road, El Dorado	Butler
Socony Mobil Oil Company, Inc.	P.O. Box 546, Augusta	Butler
Standard Oil Company (Indiana)	1101 Illinois, Neodesha	Wilson
Vickers Petroleum Company, Inc.	Wichita[b]	Sedgwick

[a] Succesor to Shallow Water Refining Company, refinery at Shallow Water, Scott County.
[b] Refinery at Potwin, Butler County.

changes from year to year. For this reason no directory of oil companies is included in this report.*

A directory of refineries is given in Table 14, because the number of oil refineries is less variable than the number of oil companies.

Natural Gas

Nationwide, Kansas ranks fifth as a producer of natural gas, second most valuable mineral produced in the state. In 1957, Kansas produced 580,698,954 thousand cubic feet of gas, 54,767,197 thousand cubic feet (10.4 percent) more than in 1956. Natural gas produced in the state in 1957 was valued at $63,876,885 as compared to $57,852,493 in 1956, a gain of 10.4 percent (Table 15). Cumulative natural gas production in Kansas from the first recorded production to the end of 1957 is estimated at 4,996,665,858 thousand cubic feet.

Table 15.—*Natural gas production in Kansas, 1956 and 1957*

Year	Production, M cu. ft. (14.65 psia)	Value	Price, cents per M cu. ft.
1956	525,931,757	$57,852,493	11
1957	580,698,954	63,876,885	11
Percent change	+10.4	+10.4	

Of the total amount of gas produced in 1957 in the state, 396,889,199 thousand cubic feet (68.3 percent) came from the Hugoton Gas Area comprising all or part of Finney, Grant, Hamilton, Haskell, Kearny, Morton, Seward, Stanton, and Stevens Counties, in southwestern Kansas (Table 16). Natural gas was

Table 16.—*Production of natural gas in Hugoton Gas Area, Kansas, 1956 and 1957*

Year	Production, M cu. ft. (14.65 psia)	Value	Percent of state total production
1956	381,874,779	$42,006,226	72.6
1957	396,889,199	43,657,812	68.3
Percent change	+3.9	+3.9	

produced in 50 counties in 1957, three more than in 1956. Eighteen counties, one more than in 1956 (Table 17), produced 2 bil-

*For the names of oil companies, independent operators, and consulting geologists, see the Kansas Geological Society Directory published by the Society at 508 East Murdock Street, Wichita 5, Kansas, and Morrison Petroleum Directory of Kansas published annually by John H. Morrison, Box 191, Wichita, Kansas.

TABLE 17.—*Production of natural gas in Kansas counties producing 2 billion cubic feet or more annually, 1956 and 1957*

County	Production, M cu. ft. (14.65 psia)		Rank	
	1956	1957	1956	1957
Stevens[a]	102,139,834	105,873,672	1	1
Morton[a, b]	73,484,852	97,495,814	3	2
Grant[a]	77,166,752	78,728,061	2	3
Kearny[a]	63,479,195	62,972,766	4	4
Barber	50,113,968	53,465,524	5	5
Finney[a]	38,048,847	43,897,674	6	6
Haskell[a]	31,391,477	32,302,065	7	7
Seward[a, b]	29,925,323	29,880,750	8	8
Stanton[a]	16,916,185	20,143,455	9	9
Meade	7,387,699	11,058,197	10	10
Kingman	6,860,788	10,081,383	11	11
Hamilton[a]	4,297,064	4,023,123	13	12
Pawnee	4,608,215	3,352,053	12	13
Kiowa	2,397,523	3,249,342	17	14
Clark	....	3,147,851	....	15
Rush	2,548,288	2,823,194	16	16
Cowley	....	2,630,410	....	17
Harper	2,590,594	2,030,168	15	18
Sumner	2,690,841	....	14	....

[a] Hugoton Gas Area Counties

[b] Not all gas produced in Morton and Seward Counties is from the Hugoton Gas Area.

lion cubic feet of gas or more in 1957. Counties added to this category in 1957 include Clark, 15th in rank, and Cowley, 17th. Sumner County, which in 1956 produced 2,690,841 thousand cubic feet of gas and ranked 14th, produced less than 2 billion cubic feet of gas in 1957. Among these 18 leading gas producing counties, Stevens County held its lead, producing 105,873,672 thousand cubic feet. Morton County, third in 1956, advanced to second place in 1957, displacing Grant County, which dropped to third. Counties ranking 4th to 11th in 1956 maintained their positions in 1957. Hamilton County advanced from 13th to 12th in 1957, displacing Pawnee County. Kiowa County advanced from 17th in 1956 to 14th in 1957. Rush County maintained 16th rank and Harper County dropped from 15th in 1956 to 18th in 1957.

On the basis of cumulative production of natural gas of 10 billion cubic feet or more to the end of 1957, at least five counties are added to the seventeen counties constituting the list for 1956 (Table 18). Edwards County attained a cumulative total production of 10,345,845 thousand cubic feet of gas in 1957. Although complete production records are not available or are nonexistent, it is certain from the records that are extant that four

TABLE 18.—*Leading gas producing counties in Kansas based on estimated and recorded cumulative production of 10 billion cu. ft. of gas or more to end of 1957**

County	Cumulative production, M cu. ft. (14.65 psia)	Rank 1956	Rank 1957
Stevens[a]	1,584,640,292	1	1
Grant[a]	853,121,161	2	2
Kearny[a]	594,005,494	3	3
Morton[a, b]	439,287,981	4	4
Barber	345,475,511	5	5
Haskell[a]	314,841,724	6	6
Finney[a]	295,903,127	7	7
Seward[a, b]	243,017,244	8	8
Stanton[a]	127,368,969	9	9
Pawnee	35,194,676	11	10
Rice	33,926,683	10	11
Meade	28,510,462	14	12
Hamilton[a]	26,302,504	13	13
Kingman	23,737,728	16	14
Barton	22,929,422	12	15
Pratt	19,148,036	15	16
Stafford	11,811,817	17	17
Edwards	10,345,845	18	18

[a] Hugoton Gas Area Counties.

[b] Not all gas produced in Morton and Seward Counties is from the Hugoton Gas Area.

* Several eastern Kansas counties, although no longer important gas producers, formerly yielded great quantities of gas. Published cumulative production data on gas production for eastern counties are not available. It is reasonably certain, however, from data that are extant, that Allen, Cowley, Montgomery, and Wilson Counties have each produced 10 billion cubic feet of gas or more.

eastern counties, Allen, Cowley, Montgomery, and Wilson, have each produced 10 billion cubic feet of gas or more since production started. Allen, Montgomery, and Wilson Counties no longer produce large quantities of gas, but Cowley County returned to the ranks of leading gas producers in 1957, producing 2,630,410 thousand cubic feet of gas. Several interchanges in rank are to be noted. Rice County, 10th in 1956, became 11th in 1957; Pawnee County, 11th in 1956, was 10th in 1957; Barton County, 12th in 1956, dropped to 15th in 1957; Meade County, 14th in 1956, advanced to 12th in 1957; Pratt County, 15th in 1956, was 16th in 1957; and Kingman County advanced from 16th in 1956 to 14th in 1957. Table 18 shows the cumulative gas production and rank of the leading Kansas counties.

The reserves of natural gas in 1957, estimated at 19,295,978 million cubic feet, exceeded those of 1956 by 1,729,721 million cubic feet or 9.8 percent (Table 19). Twenty-six new gas fields (21 gas and 5 gas and oil fields) were discovered in 1957, 12

TABLE 19.—*Natural gas reserves and gas fields discovered and revived in Kansas, 1956 and 1957*
(American Gas Association, 1956 and 1957)

Year	Reserves, million cu. ft.	Percent change from previous year	Gas fields discovered	Gas fields revived	Total
1956	17,566,257		38[a]	1	39
1957	19,295,978	+9.8	26[b]	1	27

[a] Three fields produced both gas and oil.
[b] Five fields produced both gas and oil.

fewer than in the previous year. One gas field in Rice County was revived (Table 13).

Northern Gas Company started building a 30-inch, 8-mile natural gas pipeline loop extending from Hanover to a point near Washington, Washington County.

NATURAL GAS LIQUIDS

Production of natural gas liquids, consisting of natural gasoline, propane, butane, and other miscellaneous liquefied gases, increased by 12.1 percent and value by 11.5 percent in 1957. In 1956 the total quantity of natural gas liquids amounted to 4,747,247 bbl. worth $11,868,823, whereas in 1957 production was 5,324,247 bbl. worth $13,256,845 (Table 20). In 1957 all natural gas liquids showed increases both in quantity and in value. The estimated average price per barrel of natural gasoline in 1957 was $2.52, which is 2 cents more than in 1956. All other natural gas liquids in 1957 were computed at an average of $2.45, which is 5 cents less than in the previous year.

Proved reserves of natural gas liquids increased 10.2 percent in 1957 to 189,155,000 bbl.

Skelly Oil Company purchased the natural gasoline plant of the Kansas Power and Light Company at Medicine Lodge,

TABLE 20.—*Production and value of liquefied petroleum gas (LPG) in Kansas in 1956 and 1957*

	1956		1957	
	Quantity, bbl.	Value[a]	Quantity, bbl.	Value[b]
Natural gasoline	2,550,686	$ 6,376,715	2,820,738	$ 7,108,260
Propane	1,128,619	2,821,548	1,202,764	2,958,799
Butane	791,832	1,979,580	1,004,614	2,461,304
Other LPG	276,110	690,980	296,131	728,482
All liquid hydrocarbons	4,747,247	$11,868,823	5,324,247	$13,256,845
Percent change from 1956			+12.1	+11.5

[a] Estimated average price $2.50 per barrel.
[b] Estimated average price $2.52 per barrel for natural gasoline, all others $2.45.

Barber County. The capacity of this plant has been enlarged from 10,000 gallons to 40,000 gallons daily.

Natural gasoline and liquefied petroleum gases were produced by 12 companies in 16 plants located in 11 counties. Plants on record as of December 31, 1957, are listed in Table 21.

TABLE 21.—*Directory of Kansas plants producing natural gasoline and liquefied petroleum gas on record as of December 31, 1957*

Plant location		
County	Town	Company
Barber	Medicine Lodge	Skelly Oil Company
Cowley	Atlanta	The Texas Company
Finney	Holcomb	Northern Natural Gas Company
Grant	Ulysses	Hugoton Production Company
do	do	Magnolia Petroleum Company
do	do	Pan American Petroleum Corp.
Haskell	Sublette	Northen Natural Gas Company
Kearny	Deerfield	Kansas-Nebraska Natural Gas Company
do	Lakin	Colorado Interstate Gas Company
Kingman	Cunningham	Skelly Oil Company
do	Spivey	Magnolia Petroleum Company
Reno	Burrton	Cities Service Oil Company
Rush	Otis	Dunn-Mar Oil & Gas Company
Sedgwick	Cheney	Drillers Gas Company
do	Wichita	Cities Service Oil Company
Seward	Liberal	Panhandle Eastern Pipe Line Company

HELIUM

Helium production in Kansas declined from 45,035,200 cu. ft. in 1956 to 37,249,900 cu. ft. in 1957. Shipments of helium were 36,743,000 cubic feet valued at $569,517, a decrease of 17.3 percent. Production and price are controlled by the Federal Government. Federal agencies pay $15.50 per 1000 cu. ft. at the production plants. Other users pay $19.00 at the plant and an additional $2.00 per thousand cu. ft. for helium supplied in standard cylinders. The Kansas helium was produced at the United States Bureau of Mines plant at Otis, Rush County. The gas is extracted from helium-bearing natural gas from more than 80 wells distributed in Barton, Pawnee, and Rush Counties. Helium-contributing gas fields include the Otis-Albert field in Rush and Barton Counties, the Ryan field in Rush and Pawnee Counties, the Pawnee Rock and Ash Creek fields in Pawnee County, and the Behrens, Unruh, Dundee, and Bergtal fields in Barton County.

Carbon Black

In 1957 Kansas produced 76,419,500 pounds of carbon black, 29,261,334 pounds (27.7 percent) less than in 1956. The 1957 product was worth $5,131,569 whereas 1956 production was valued at $6,590,663, a difference of 22.2 percent (Table 22). Carbon black ranked ninth in value among the mineral commodities produced in the state.

Table 22.—*Quantity and value of carbon black produced in Kansas, 1956 and 1957*

Year	Quantity, lb.	Value	Estimated gas consumed, billion cu. ft. (at 14.65 psia)
1956	105,680,834	$6,590,663	8.3
1957	76,419,500	5,131,569	5.7
Percent change	—27.7	—22.2	

Carbon black was produced by the Columbian Carbon Company, 380 Madison Avenue, New York 17, New York, at Hickok, Grant County, and by the United Carbon Company, P. O. Box 122, Satanta, Haskell County (plant at Ryus, Grant County).

NONMETALLIC MINERALS

The value of the 1957 production of nonmetallic minerals exclusive of mineral fuels and associated products (cement, clay, diatomaceous marl, gypsum, pumicite or volcanic ash, salt, sand and gravel, stone, and perlite and vermiculite products) was $62,045,148, or 11.6 percent of the total value of all minerals produced in the state (Table 4, Fig. 3).

Cement (Portland and Masonry)

For the first time since 1950 the cement industry in 1957 showed a decline in production not only in Kansas but elsewhere in the United States. Demand for cement was as great as ever; the decline must be attributed to widespread and prolonged strikes in the industry. Total production and total shipments of cement, excluding natural cement, in Kansas in 1957 were 8,423,003 bbl. and 8,177,330 bbl. respectively, whereas in 1956 total cement production amounted to 10,877,043 bbl. and total shipments to 10,598,317 bbl. The decrease in total production in 1957 was 22.6 percent compared to 1956. The value of shipments in 1957 was $24,814,774, which is 19.2 percent less than in 1956,

TABLE 23.—*Production and shipments of portland and masonry cement in Kansas, 1956 and 1957, 376-lb. bbl.*

Commodity	Production, bbl.		Shipments			
			1956		1957	
	1956	1957	Bbl.	Value	Bbl.	Value
Portland	10,486,150	8,117,799	10,239,578	$29,370,845	7,863,624	$23,593,482
Ave. price/bbl.				2.87		3.00
Percent change from 1956		—22.6			—23.3	—19.7
Masonry	380,893	305,204	358,739	1,324,938	313,706	1,221,292
Ave. price/bbl.				3.69		3.89
Percent change from 1956		—19.9			—12.6	—7.9
Total	10,877,043	8,423,003	10,598,317	30,695,773	8,177,330	24,814,774
Percent change from 1956		—22.6			—22.9	—19.2

TABLE 24.—*Directory of cement producers in Kansas, 1957*

County	Company	Office address	Quarry	Type
Allen	Lehigh Portland Cement Co.	Young Building, 718 Hamilton St., Allentown, Pa.	Iola	Portland and masonry
Allen	Monarch Cement Co.	Humboldt	Humboldt	do
Bourbon	Fort Scott Hydraulic Cement Co.	Fort Scott	Fort Scott	Natural
Montgomery	Universal Atlas Cement Co.	100 Park Ave., New York 17, New York	Independence	Portland and masonry
Neosho	Ash Grove Lime & Portland Cement Co.	101 W. 11th, Kansas City 6, Mo.	Chanute	do
Wilson	Consolidated Cement Corp.	Fredonia	Fredonia	do
Wyandotte	Lone Star Cement Corp.	1650 Dierks Bldg., Kansas City 6, Mo.	Bonner Springs	do

when the value amounted to $30,695,773. Shipments of portland cement decreased 23.3 percent in 1957, from 10,239,578 bbl. in 1956 to 7,863,624 bbl. in 1957. Masonry cement production and shipments showed relatively greater losses than did portland cement. Kansas produced 380,893 bbl. of masonry cement and shipped 358,739 bbl. in 1956, whereas 1957 production amounted to 305,204 bbl. and shipments to 313,706 bbl. Value of shipments of masonry cement in 1957 was $1,221,292, which was $153,646 (11.2 percent) less than in 1956. Prices per barrel of shipped cement, both portland and masonry, were higher in 1957 than in 1956, by 13 and 20 cents respectively.

As in previous years, Allen County, which includes two of the seven cement plants in the state, led in production and shipments of cement. Neosho County produced more cement than did Montgomery County, although the latter's shipments exceeded those of Neosho County. Stocks on hand at yearend were 226,087 bbl., 29 percent greater than in 1956. One company, the Fort Scott Hydraulic Cement Company, Fort Scott, Bourbon County, produced natural cement. Its production is included under "undistributed" minerals in Table 1. Natural cement is discussed on page 237.

Cement is third in importance among the minerals produced in Kansas. Data pertaining to cement are presented in Table 23.

The seven cement producers on record as of December 31, 1957, are listed in Table 24.

Monarch Cement Company scheduled a $6,500,000 expansion program at its plant at Humboldt, Allen County, to increase the plant's capacity by 50 percent to 2,250,000 bbl. annually. The plans call for a new crushing plant at the quarry site, a third kiln, and a new milling department.

Clay and Shale

Clay and shale production in Kansas in 1957 was slightly less than it was in 1956. Total quantity of clay and shale produced was 908,693 tons compared to 977,099 tons in 1956, a decrease of 7.1 percent. The value of the 1957 production, however, was 6 percent greater than that of the previous year. Value of raw clay and shale produced in 1957 was $1,239,789, whereas in 1956 it was $1,169,048 (Table 25). Kansas clay and shale produced consists of fire clay and miscellaneous clay (including shale used

TABLE 25.—*Clay and shale sold or used by producers in Kansas, 1956 and 1957*

Year	Brick, tile, lightweight aggregate		Cement		Total		Clay and clay products
	Tons	Value	Tons	Value	Tons	Value	
1956	588,312	$780,261	388,787	$388,787	977,099	$1,169,048	$10,000,000
1957	595,536	926,632	313,157	313,157	908,693	1,239,789	10,000,000
Percent change from 1956	+1.2	+18.7	—19.5	—19.5	—7.1	+6.0	

TABLE 26.—*Directory of clay and shale producers in Kansas in 1957*

County	Company	Office address	Pit location	Type plant*
Allen	Humboldt Brick and Tile Co.	P.O. Drawer 97, Humboldt	Humboldt	B
Allen	Lehigh Portland Cement Co.	Young Bldg., 718 Hamilton St., Allentown, Pa.	Iola	C
Allen	Monarch Cement Co.	Humboldt	Humboldt	C
Allen	United Brick & Tile Co.	207 Pickwick Bldg., Kansas City 42, Mo.	Iola	B
Barton	Great Bend Brick & Tile Co.	P.O. Box 53, Great Bend	Great Bend	B
Barton	Kansas Brick & Tile Co.	Hoisington	Hoisington	B
Cherokee	United Brick & Tile Co.	207 Pickwick Bldg., Kansas City 42, Mo.	Weir	B
Cloud	Cloud Ceramics	Concordia	Concordia	B
Crawford	W. S. Dickey Clay Mfg. Co.	607-617 Commerce Trust Bldg., Kansas City 6, Mo.	Pittsburg	B
Ellsworth	Great Bend Brick & Tile Co.	P.O. Box 53, Great Bend	Kanopolis	B
Franklin	Buildex, Inc.	312 Globe Bldg., Pittsburg	Ottawa	A
Jewell	Ideal Cement Co.	507 Denver Nat'l Bank Bldg., Denver, Colo.		C
Leavenworth	Kansas State Penitentiary	Lansing	Lansing	M
Montgomery	Ludowici-Celadon Co.	75 East Wacker Drive, Chicago 1, Ill.	Coffeyville	B
Montgomery	United Brick & Tile Co.	207 Pickwick Bldg., Kansas City 42, Mo.	Coffeyville	B
Montgomery	Universal Atlas Cement Co.	100 Park Ave., New York 17, N.Y.	Independence	C
Neosho	Ash Grove Lime & Portland Cement Co.	101 W. 11th St., Kansas City 6, Mo.	Chanute	C
Wilson	Acme Brick Co.	Fort Worth, Texas	Buffalo	B
Wilson	Consolidated Cement Corp.	Fredonia	Fredonia	C
Wilson	Excelsior Brick Co.	P.O. Box 32, Fredonia	Fredonia	B
Wyandotte	Kansas Industries, Inc.	4001 Kaw Drive, Kansas City	Kansas City	A
Wyandotte	Lone Star Cement Corp.	1650 Dierks Bldg., Kansas City 6, Mo.	Bonner Springs	C

* A, aggregate; B, brick; C, cement; M, miscellaneous.

for cement), the former being produced in Barton, Cloud, Crawford, and Ellsworth Counties, the latter in Allen, Cherokee, Crawford, Franklin, Jewell, Montgomery, Wilson, and Wyandotte Counties. Fire clay production in 1957 declined 39.9 percent in quantity and 43.9 percent in value from 1956, and miscellaneous clay declined 25.8 percent in tonnage and 26.8 percent in value. Clay used for cement in 1957 amounted to 344,080 tons, or 44,707 tons (14.5 percent) less than in 1956. In 1957, 14 companies operating in 11 counties produced clay or shale. Disregarding clay used for cement, Crawford and Franklin Counties led in 1957 as they did in 1956. Kansas clay and shale is used primarily for the manufacture of brick (of which 100,639,000 were produced in 1957, 23,364,000 fewer than in 1956), tile, cement, and lightweight aggregate. Raw clay and shale ranked 14th among mineral commodities produced in 1957 and fifth if clay products are included.

Dickey Clay Manufacturing Company at Pittsburg, Crawford County, started expanding its facilities to increase its annual production to approximately 100,000 tons, an increase of 25 percent. In Ellsworth County, the Great Bend Brick and Tile Company was producing about 50,000 brick per day in its new $500,000 plant at Kanopolis.

Reserves of clay and shale are without limit. In central and north-central Kansas, where the most valuable clays in the state are found, reserves of strippable highgrade clays are estimated to be at least 125 billion tons.

A directory of clay and shale producers in Kansas in 1957 is given in Table 26.

Salt

Salt production in Kansas in 1957 amounted to 1,018,027 tons valued at $10,353,119, an increase in tonage of 1.3 percent and an

TABLE 27.—*Salt sold or used by producers in Kansas in 1956 and 1957, short tons*

	Evaporated salt		Rock salt		Total	
Year	Tons	Value	Tons	Value	Tons	Value
1956*	461,418	$6,352,290	542,624	$2,815,074	1,004,042	$ 9,167,364
1957	521,855	7,784,988	496,172	2,568,131	1,018,027	10,353,119
Percent change from 1956	+13.0	+22.5	—8.6	—8.8	+1.3	+12.9

* Revised figures.

increase of 12.9 percent in value compared with production and value in 1956 (Table 27). Salt produced by the evaporating process in 1957 showed an increase of 13 percent in tonnage and 22.5 percent in value compared to that of the previous year. In 1957, production of evaporated salt amounted to 521,855 tons valued at $7,784,988, whereas in 1956 the tonnage and value were respectively 461,418 tons and $6,352,290. Rock salt production continued to decline. In 1957 Kansas produced 496,172 tons of rock salt or 46,452 tons less than in 1956, a decrease of 8.6 percent. For the first time since 1950, the value was less than that of the previous year. In 1957 the value of rock salt was $2,568,131, or $246,943 less than in 1956, a decrease of 8.8 percent. As in previous years, the value of the evaporated salt was approximately three times as great as that of the rock salt. Salt was produced by five companies operating in three counties, Ellsworth, Reno, and Rice, the Reno County production being more than half of the total. In addition to the regular commercial salt producing companies, the Frontier Chemical Company of Kansas, Inc., Wichita, a division of the Union Chemical and Materials Corporation, produced its own salt from wells in Sedgwick County near Wichita for use in the manufacture of industrial inorganic chemicals.

Salt ranked sixth in value among minerals produced in the state in 1957. Since salt production first started, Kansas has produced less than 5,000,000 tons of salt, and reserves are estimated to be more than 5,000,000,000,000 tons, an amount for all practical purposes inexhaustible.

TABLE 28.—*Directory of salt producing companies in Kansas in 1957*

County	Company	Office address	Location of mine or well	Type of plant
Ellsworth	Independent Salt Co.	4115 Packers Ave., Chicago 9, Ill.	Kanapolis	Rock
Reno	The Barton Salt Co.	Hutchinson	Hutchinson	Evaporated
do	The Carey Salt Co.	do	do	Rock and evaporated
do	Morton Salt Co.	120 S. LaSalle, Chicago 3, Ill.	do	Evaporated
Rice	American Salt	630 New York Life Bldg., Kansas City 6, Mo.	Lyons	Evaporated and rock
Sedgwick	Frontier Chemical Co. of Kansas, Inc.	P.O. Box 545, Wichita	Wichita	Brine

The Carey Salt Company of Hutchinson, Reno County, has moved into its spacious new office building.

The five salt companies that operated in the state in 1957 are listed in Table 28.

Sand and Gravel

In 1957 Kansas produced approximately one-fourth less sand and gravel than in 1956 (Table 29). Total sand and gravel produced in 1957 was 9,344,908 tons valued at $6,174,757 as compared to 1956 production of 12,515,164 tons valued at $8,022,312. The decrease in production and value is best explained by the fact that the Kansas Turnpike was completed by 1957. Sand and gravel were produced in 70 counties by 108 commercial operators and 46 noncommercial producers, a total of 154 agencies. In 1957, sand and gravel ranked eighth in value among the minerals produced in the state. Of the total sand and gravel produced in 1957, commercial operators produced 7,679,555 tons and noncommercial agencies 1,665,353 tons. Sedgwick and Wyandotte Counties accounted for 3,292,548 tons of sand and gravel, or 35.2 percent of the total, about the same as in 1956. Most of the sand and

Table 29.—*Sand and gravel sold or used by commercial and noncommercial producers in Kansas, 1956 and 1957*

Year	Commercial		Noncommercial		Total sand and gravel		Ave. price per ton
	Short tons	Value	Short tons	Value	Short tons	Value	
1956	10,656,464	$7,428,877	1,858,700	$593,435	12,515,164	$8,022,312	.64
1957	7,679,555	5,424,703	1,665,353	750,054	9,344,908	6,174,757	.66
Percent change from 1956	—28	—27	—10.4	+26.3	—25.4	—23.1	

gravel was used for paving and structural purposes, but much was used as engine and filter sand (Table 30 and 31). Other uses of Kansas sand include blast, molding, and railroad ballast sands.

Sand and gravel reserves are regarded as inexhaustible because the demand for sand and gravel is insignificant compared to the quantity available. Furthermore, sand especially is continually being replaced by new deposits brought in by streams as the river sand is used.

A new sand and gravel company, known as the Beloit Sand Company, has been formed at Beloit, Mitchell County. This company will produce on the average 150 cubic yards of graded sand and gravel daily from its pit located west of Beloit and thus will

TABLE 30.—*Production of sand in Kansas, 1956 and 1957, by uses*

Use		Production and value 1956	1957
Paving	Tons	4,909,428	3,034,700
	Value	$2,929,790	$1,967,245
Structural	Tons	3,640,946	2,897,144
	Value	$2,651,234	$2,073,006
Engine	Tons	62,308	33,615
	Value	$ 50,914	$ 25,218
Railroad ballast	Tons	51,738	*
	Value	$ 30,523	*
Filter	Tons	21,771	16,092
	Value	$ 34,061	$ 17,320
Molding	Tons	*	*
	Value	*	*
Glass	Tons	*	....
	Value	*	....
Blast	Tons	*	*
	Value	*	*
Other	Tons	302,743	466,561
	Value	$ 188,325	$ 221,782

* Undistributed, value included with "Other".

TABLE 31.—*Production of gravel in Kansas, 1956 and 1957, by uses*

Use		Production and value 1956	1957
Paving	Tons	3,255,008	2,540,302
	Value	$1,850,366	$1,522,630
Structural	Tons	218,922	300,327
	Value	$ 173,302	$ 234,080
Railroad ballast	Tons	11,181	....
	Value	$ 6,212	....
Other	Tons	41,119	66,167
	Value	$ 107,585	$ 113,476

add one to the mineral producing counties of the state. Peck-Woolf Sand and Material Company has been granted a permit for the preparatory grading and initial construction of sand-dredging apparatus at its plant in Wyandotte County.

Sand and gravel producers that operated in 1957 are listed in Table 32.

TABLE 32.—*Directory of sand and gravel producers on record as of December 31, 1957*

County	Company or operator	Address
Anderson	Anderson Co. Highway Dept.	Garnett
Barber	Barber Co. Highway Dept.	Medicine Lodge
Barton	Barton Co. Highway Dept.	P.O. Box 747, Great Bend
	Arkansas Sand & Gravel Co.	1619 Stone St., Great Bend
	Du Bois Sand Co.	P.O. Box 172, Great Bend
	Gruber Sand Plant	918 Stone St., Great Bend
	Moos Bros. Sand Co.	P.O. Box 406, Great Bend
Brown	Brown Co. Highway Dept.	Hiawatha
	Ralph Mitchell	Route 1, Hiawatha
Butler	Butler Co. Highway Dept.	El Dorado
Chase	Chase Co. Highway Dept.	Cottonwood Falls
	Chautauqua Co. Highway Dept.	Sedan
Cheyenne	New Era Sand & Gravel Co.	St. Francis
Clark	Clark Co. Highway Dept.	Ashland
Clay	Gladys Alsop	Wakefield
	Clay Center Concrete & Sand Co., Inc.	Clay Center
Cloud	Cloud Co. Commissioner	Concordia
	Earl Beaver Sand Co.	Glasco
	Harry Henery, Inc.	P.O. Box 15, Ottawa
	Ross Sand Co., Inc.	P.O. Box 461, Concordia
	Walker Sand Co.	1611 Cedar St., Concordia
Comanche	Comanche Co. Highway Dept.	Coldwater
Cowley	Cowley Co. Highway Dept.	Winfield
	Arkansas City Sand & Gravel Co.	P.O. Box 166, Arkansas City
	Oxford Sand & Gravel Co.	P.O. Box 266, Oxford
	Phillips & Son Construction Co.	P.O. Box 50, Winfield
	Wilson Bros.	P.O. Box 59, Route 1, Arkansas City
Decatur	Decatur Co. Highway Dept.	Oberlin
Dickinson	Shoffner Sand & Gravel Co.	134 E. Jewell St., Salina
Douglas	Bowersock Mills & Power Co.	546 Massachusetts St. Lawrence
Edwards	Dave Showalter	Garfield
Elk	Elk Co. Highway Dept.	Howard
Ellis	Lewis C. Schmidtberger	P.O. Box 93, Victoria
Ellsworth	Ellsworth Co. Highway Dept.	Ellsworth
	Henry Milberger	Wilson
	San Ore Construction Co.	McPherson
Finney	Finney Co. Highway Dept.	Garden City
	San Alsop Construction Co.	1207 Pinecrest, Garden City
	Smith Sand Co.	P.O. Box 2, Burnside Drive, Garden City
Ford	Davis Sand Co.	Route 1, Dodge City
	Dodge City Sand Co.	P.O. Box 430, Dodge City
	Miller Sand & Gravel Co.	Dodge City
	San Ore Construction Co.	McPherson
Geary	Junction City Sand & Gravel Co.	Route 3, Junction City
	Moore Sand Co.	626 W. 6th St., Junction City

County	Company or operator	Address
Gove	Gove Co. Highway Dept.	Gove
	Ray Bigbee	Grinnel
Graham	M. W. Watson	1004 Nat'l Bank of Topeka Bldg., Topeka
Grant	Grant Co. Highway Dept.	Ulysses
	Harry Henery, Inc.	P.O. Box 15, Ottawa
Gray	Harry Henery, Inc.	P.O. Box 15, Ottawa
	Kerr Sand Co.	Cimarron
Hamilton	Smith Sand Co.	P.O. Box 2, Burnside Drive, Garden City
	Syracuse Sand & Gravel Co.	107 N. Elizabeth St., Syracuse
	M. W. Watson	1004 Nat'l. Bank of Topeka Bldg., Topeka
Harper	Harper Co. Highway Dept.	Anthony
Harvey	Howard R. Thach	Route 1, Burton
Haskell	Howard Mitchell	Hugoton
Jewell	Jewell Co. Highway Dept.	Mankato
	San Ore Construction Co.	McPherson
Kearny	Kearny Co. Highway Dept.	Lakin
	Glen Popejoy	Ulysses
Kingman	Ray Wells	Route 1, Kingman
Kiowa	Kiowa Co. Highway Dept.	Greensburg
	Seacat Sand & Excavating Co.	Greensburg
Leavenworth	Missouri Valley Sand, Inc.	P.O. Box 822, Leavenworth
Linn	Linn Co. Highway Dept.	Mound City
Logan	Thomas Co. Highway Dept.	Colby
Lyon	Wesley Parks	648 Oak Street, Emporia
	Harry Waterman	Route 1, Emporia
Marshall	Marshall Co. Highway Dept.	Marysville
	Blue River Sand & Gravel Co.	Blue Rapids
	C. V. Garrett	Blue Rapids
	Heinzelman Construction Co.	Marysville
McPherson	McPherson Co. Highway Dept.	McPherson
Miami	Miami Co. Highway Dept.	Paola
Morris	Morris Co. Highway Dept.	Council Grove
	Virgil Metcalf	Route 3, Council Grove
Norton	Norton Co. Highway Dept.	Norton
	Inland Construction Co.	3867 Leavenworth St., Omaha, Nebr. P.O. Box 1993, Wichita
Osborne	Osborne Co. Highway Dept.	Osborne
Ottawa	Ottawa Co. Highway Dept.	Minneapolis
Pawnee	Pawnee Co. Highway Dept.	Larned
	Johnson Sand & Gravel Co.	P.O. Box 545, Larned
	Larned Sand & Gravel Co.	P.O. Box 227, Larned
Phillips	D. G. Hansen	Logan
Pottawatomie	Pottawatomie Co. Highway Dept.	Westmoreland
	Anderson-Oxandale	P.O. Box 425, Herington
	Wamego Sand Co.	Wamego
Pratt	Pratt Co. Highway Dept.	Pratt
	C. D. Hogard	507 So. Mound St., Pratt
Reno	City Manager, Hutchinson	Hutchinson
	Haven Sand Co.	Haven
	San Ore Construction Co.	McPherson
	J. N. Shears & Sons, Inc.	P.O. Box 227, Hutchinson
	J. E. Steele Sand & Gravel Co.	Route 4, Hutchinson

County	Company or operator	Address
Republic	Republic Co. Highway Dept.	Belleville
	Gladys Alsop	Wakefield
	Walker Sand Co.	1611 Cedar St., Concordia
Rice	Arensman Sand & Gravel Co.	Chase
	Rock Hill Stone & Gravel Co.	P.O. Box 412, Sterling
	A. L. Stapleton	121 N. Logan St., Lyons
	Sterling Sand & Gravel Co., Inc.	P.O. Box 281, Sterling
	A. Tohias, W. Wright, B. D. Birchenough, Inc.	Lyons
Riley	Walters Sand Co., Inc.	P.O. Box 30, Manhattan
Rush	Inland Construction Co.	3867 Leavenworth St., Omaha, Nebr. P.O. Box 1993, Wichita
	M. W. Watson	1004 Nat'l Bank of Topeka Bldg., Topeka
Russell	Russell Co. Highway Dept.	Russell
Saline	Salina Sand Co., Inc.	Mentor
Sedgwick	City Engineer, Wichita	Wichita
	Bentley Sand Co.	Bentley
	Big Three Sand & Gravel Co.	3020 West 21st. St., Wichita 12
	Dolese Brothers Co.	13 N.W. 13th St., Oklahoma City, Okla.
	L. C. House	Route 2, Sedgwick
	Inland Construction Co.	3867 Leavenworth St., Omaha, Nebr. P.O. Box 1993, Wichita
	Walt Keeler Co., Inc.	P.O. Box 1972, Wichita 1
	Miles Sand Service	3925 West 53rd. St., Wichita
	Provence Sand Co.	6600 W. 13th St., Wichita
	Southwest Sand & Gravel Co.	4505 Southwest Blvd., Wichita 15
	Superior Sand Co., Inc.	1717 W. 21st. St., Wichita 3
Shawnee	Consumers Sand Co.	Topeka
	Kansas Sand Co., Inc.	531 N. Tyler St., Topeka
	River Sand Co.	P.O. Box 233, Topeka
	Shoffner Sand, Inc.	1939 McAllister St., Topeka
	Victory Sand & Stone Co.	P.O. Box 281, Topeka
Sheridan	Sheridan Co. Highway Dept.	Hoxie
	Carl Kaiser	Grainfield
Sherman	Sherman Co. Highway Dept.	P.O. Box 22, Goodland
	Tom Ramsey	802 Center St., Goodland
Smith	San Ore Construction Co.	McPherson
Stafford	Stafford Co. Highway Dept.	St. John
	Partin Sand & Gravel Co.	P.O. Box 274, Stafford
Sumner	Sumner Co. Highway Dept.	Wellington
	Mulvane Sand Co., Inc.	503 E. Mulvane St., Mulvane
Thomas	Thomas Co. Highway Dept.	Colby
	Hawki-Carpenter	Colby
	Ed Purma	975 2nd. St., Colby
Trego	Trego Co. Highway Dept.	WaKeeney
Wabaunsee	Wabaunsee Co. Highway Dept.	Alma
Wallace	Wallace Co. Highway Dept.	Sharon Springs

County	Company or operator	Address
Washington	Washington Co. Highway Dept.	Washington
	Finlayson Gravel	Barnes
	Mueller Sand & Gravel Co.	Hanover
Wyandotte	American Sand Co.	5731 Kansas Ave., Turner
	Builders Sand Co.	P.O. Box 658, Argentine Sta., Kansas City 6
	Dreyer Sand Co.	Turner
	Happe Sand Co.	5411 Birch St., Mission
	Holliday Sand & Gravel Co.	2 West 40th St., Kansas City 11, Missouri
	Peck-Woolf Sand & Material Co.	1920 Paseo Blvd., Kansas City 8, Missouri
	Ralph Rees	Route 1, Bonner Springs
	Stewart Sand Material Co.	4049 Penn. Ave., Kansas City 11, Missouri
Various	Sand, Inc.	1313 West 31, South Wichita 2
	D. G. Hansen	Logan

Stone

Production of stone, which ranked fourth in importance among the minerals produced in Kansas in 1957, amounted to 10,411,500 tons valued at $11,926,238, a decrease of 22.5 percent in tonnage and 24.1 percent in value compared to 1956 (Table 33). Stone produced in Kansas consists of limestone, sandstone, and chat; the last is associated with the metal mining industry of the Tri-State Lead and Zinc District in southern Cherokee County. In the tables, chat is included under "miscellaneous" stone.

Most of the stone produced in Kansas in 1957 was crushed and used for concrete and road metal—5,924,724 tons valued at $7,403,101, of which 5,658,525 tons, valued at $7,297,115, was limestone. Quantitatively, next in importance was stone used for making portland and masonry cement, followed by railroad ballast, riprap material, and agricultural limestone. On the basis of value, stone for concrete and road metal was first ($7,403,101), then cement ($2,211,274), railroad ballast ($659,664), dimension stone ($448,457), riprap material ($331,634), and agricultural limestone ($256,034). Production of all stone except railroad ballast declined during 1957. A summary of Kansas stone production and values by kinds for 1956 and 1957 is presented in Table 34. Table 35 shows Kansas stone production and value by kinds of rock and uses for 1956 and 1957.

TABLE 33.—*Quantity and value of stone produced in Kansas, 1956 and 1957, by kinds*

Year	Limestone		Sandstone		Miscellaneous		Total stone	
	Tons	Value	Tons	Value	Tons	Value	Tons	Value
1956*	11,654,354	$14,630,304	314,878	$516,242	1,464,620	$556,799	13,433,852	$15,703,345
1957	8,871,426	11,278,363	**	**	1,540,074	647,875	10,411,500	11,926,238
Percent change from 1956	—23.9	—29.8			+5	+16.3	—22.5	—24.1

* Revised figures.
** Excludes all sandstone, value for which is included under "Undistributed" in Table 1.

TABLE 34.—*Summary of stone production in Kansas, 1956 and 1957, by uses*

Use		1956[c]	1957[d]	Percent change from 1956
Concrete	Tons	7,598,092	5,924,724	—22.1
	Value	$ 9,540,862	$ 7,403,101	—22.5
Cement	Tons	2,897,487	2,211,274	—23.7
	Value	$ 2,955,050	$ 2,211,274	—25.2
Riprap	Tons	977,878	344,465	—65.8
	Value	$ 987,113	$ 313,634	—68.3
Dimension stone[a]	Tons	28,375	20,477	—27.9
	Value	$ 683,495	$ 448,457	—34.4
Railroad ballast	Tons	1,249,983	1,366,856	+ 9.3
	Value	$ 672,928	* 659,664	— 2.0
Agricultural	Tons	261,368	196,606	—24.8
	Value	$ 378,191	$ 256,034	—32.3
Other[b]	Tons	420,669	347,098	—17.5
	Value	$ 823,195	$ 634,074	—23.0
Total	Tons	13,433,852	10,411,500	—22.5
	Value	$15,703,345	$11,926,238	—24.1

[a] Excludes dimension sandstone.
[b] Includes diatomaceous marl for 1956 and 1957 and dimension sandstone for 1956.
[c] Revised figures.
[d] All sandstone excluded.

TABLE 35.—*Kansas stone production and value by kinds of rock and uses, 1956 and 1957*

	1956		1957	
	Tons	Value	Tons	Value
Limestone				
Concrete and road metal ..	7,135,772	$ 9,285,599	5,658,525	$ 7,297,115
Cement	2,897,487	2,615,362	2,211,274	2,211,274
Riprap	882,774	853,134	344,465	313,634
Dimension stone	28,375	683,495	20,477	448,457
Agricultural	261,368	378,191	196,606	256,034
Railroad ballast	47,861	62,880	92,981	117,775
Other or miscellaneous	400,717	750,344	347,098	634,074
Sandstone				
Railroad ballast	165,253	231,025	*	*
Riprap	95,104	133,979	*	*
Concrete and road metal ..	34,569	78,487	*	*
Other (including dimension stone)	19,952	72,751	*	*
Miscellaneous				
Railroad ballast	1,036,869	379,023	1,273,875	541,889
Concrete and road metal ..	427,751	177,776	266,199	105,986
Riprap	....	....	....	....
Total all stone	13,433,852	$15,703,345	10,411,500	$11,926,238

The stone reserves of Kansas are extremely large and for practical purposes may be regarded as inexhaustible.

Stone was produced in Kansas in 1957 by 70 commercial companies operating 100 quarries in 43 counties and by 30 noncommercial operators, principally county highway departments, producing stone in 14 counties at 30 sites. Greatest activity in the stone industry centered in Cherokee, Elk, and Wyandotte Counties, which quantitatively accounted for 3,165,529 tons of stone (29.7 percent of all stone produced) valued at $2,764,432 (22.4 percent of the total). Wyandotte, Allen, Wilson, Neosho, and Elk Counties produced 52 percent of the limestone in the state, Bourbon and Lincoln Counties all of the sandstone, and Cherokee County was the sole producer of chat. Dimension limestone production was confined to Cowley, Geary, Neosho, and Pottawatomie Counties and dimension sandstone to Bourbon County.

Quartzite Stone Company at Lincoln, Lincoln County, expanded its plant by building a new 60- by 80-foot two-story building containing a drying room extending the full length of the building. Concrete Materials and Construction Company of Cedar Rapids, Iowa, established a branch plant at Manhattan, its quarry being situated near St. George, Pottawatomie County.

A directory of stone producers operating in Kansas in 1957 is given in Table 36.

TABLE 36.—*Directory of stone producers on record as of December 31, 1957*

County	Company or operator	Address
Allen	Allen Co. Highway Dept.	Iola
	Lehigh Portland Cement Co.	Iola
	Monarch Cement Co.	Humboldt
	Nelson Bros. Quarries	LaHarpe
Anderson	Garnett Rock Co.	Garnett
	Nelson Bros. Quarries	LaHarpe
	Hunt Rock Co.	Garnett
Atchison	U.S. Corps of Engineers	1800 Federal Office Bldg., Kansas City 6, Mo.
	Ralph Bromley	Atchison
	Geo. W. Kerford Quarry Co.	Atchison
Bourbon	Bandera Stone Co.	
	Bourbon Co. Highway Dept.	Fort Scott
	Cullor Limestone Co.	R.F.D. 5, Fort Scott
	Ft. Scott Hydraulic Cement Co.	P.O. Box 267, Fort Scott
Butler	Geo. M. Myers	P.O. Box 911, El Dorado
Chase	Riddle Quarries, Inc.	Nat'l Bank of America Bldg., Salina
Chautauqua	Sedan Limestone Co.	Sedan
Cherokee	Baxter Chat Co.	Baxter Springs
	Eagle-Picher	Miami, Okla.
	C. Y. Semple	P.O. Box 390, Baxter Springs
	Southwest Chat Co., Inc.	Baxter Springs
	Southwest Rock & Chat Co.	Baxter Springs
	John Stark	P.O. Box 7, Girard
Clay	Riddle Quarries, Inc.	Nat'l Bank of America Bldg., Salina
Coffey	C. L. Danials Stone Co.	P.O. Box 134, Winfield
	Jones Rock Co.	P.O. Box 128, Emporia
	Neosho Valley Rock Co.	Burlington
Cowley	John V. Elam	Winfield
	Jones Rock Co.	Silverdale
	Silverdale Cut Stone Co.	Silverdale
	Silverdale Limestone Co.	Route 3, Box 180, Arkansas City
Crawford	John Stark	Box 7, Girard
Dickinson	Anderson-Oxandale	Box 425, Herington
	Riddle Quarries, Inc.	Nat'l Bank of America Bldg., Salina
Doniphan	U.S. Corps of Engineers	1800 Federal Office Bldg., Kansas City 6, Mo.
	Everett Quarries, Inc.	Plattsburg, Mo.
	Geo. W. Kerford Co., Inc.	Atchison
	Wolf River Limestone, Inc.	Troy
Douglas	Clark Rock Quarry	Overbrook
	Perry Jones	Carbondale
Elk	Concrete Materials Const. Co.	Moline
Franklin	Franklin Co. Highway Dept.	Ottawa
	Anderson-Oxandale	Box 425, Herington
Geary	Grosshams-Peterson, Inc.	Wathena
	Walker Cut Stone Co.	P.O. Box 269, Junction City
Greenwood	Greenwood Co. Highway Dept.	Eureka
Jackson	Anderson-Oxandale	Box 425, Herington
	G. W. Baker	Holton
	Reno Construction Co.	P.O. Box 61, Overland

County	Company or operator	Address
Jefferson	Roy Baker	Valley Falls
	N. R. Hamm Quarry, Inc.	Perry
Jewell	Ideal Cement Co.	Superior, Nebr.
Johnson	Johnson Co. Highway Dept.	Olathe
	Deitz Hill Development Co.	28 SW. Blvd., Kansas City 10, Mo.
	Reno Construction Co.	P.O. Box 61, Overland Park
Labette	Labette Co. Highway Dept.	Oswego
	John Stark	Box 7, Girard
Leavenworth	City of Leavenworth Highway Dept.	Leavenworth
	Kansas State Penitentiary	Lansing
	U.S. Corps of Engineers	1800 Federal Office Bldg., Kansas City 6, Mo.
	Wyandotte Co. Highway Dept.	Kansas City
	J. C. Haigwood	Tonganoxie
	Geo. W. Kerford Co., Inc.	Atchison
	Loring Quarries, Inc.	P.O. Box 174, Bonner Springs
Lincoln	Quartzite Stone Co.	Lincoln
Linn	Lee Giles	Greeley
	Murray Limestone Products	Centerville
Marion	Walt Keeler Co., Inc.	P.O. Box 1972, Wichita 1
	Riddel Quarries, Inc.	Nat'l Bank of America Bldg., Salina
Marshall	R. Hopper Bros.	Pawnee, Nebr.
Miami	Miami Co. Highway Dept.	Paola
	A. J. Forster	Paola
	L. W. Hayes	4550 Main St., Kansas City 2, Mo.
Montgomery	Montgomery Co. Highway Dept.	Independence
	John Stark	Box 7, Girard
	Universal Atlas Cement Co.	100 Park Ave., New York 17, N.Y.
Morris	Anderson-Oxandale	Box 425, Herington
Nemaha	Anderson-Oxandale	Box 425, Herington
Neosho	Neosho Co. Highway Dept.	Erie
	Ash Grove Lime-Portland Cement Co.	101 W. 11th St., Kansas City, Mo.
	Harry Byers & Sons, Inc.	500 N. Plummer, Chanute
	Joe O'Brian	St. Paul
Osage	Perry Jones	Carbondale
Pottawatomie	Manhattan Cut Stone Co.	P.O. Box 388, Manhattan
	Manhattan Stone Co.	Route 1, Manhattan
Riley	Fort Riley Reservation, Quartermaster	Fort Riley
	Bayer Construction Co.	509 Yuma St., Manhattan
Sedgwick	Wichita Highway Dept.	City Bldg., Wichita
Shawnee	Anderson-Oxandale	Box 425, Herington
	Perry Jones	Carbondale
	Henry C. Luttjohann	2001 James St., Topeka
	Netherland Stone Co.	Route 2, Topeka
	Pattons Crushed Stone	Pauline
Wabaunsee	G. W. Baker	Holton

County	Company or operator	Address
Wilson	Benedict Rock & Lime Co.	Benedict
	Carr Rock Products Co.	315 N. 8th St., Neodesha
Wyandotte	Consolidated Cement Corp.	Fredonia
	American Rock Crusher Co.	3700 Rainbow Blvd., Rosedale
	Lone Star Cement Corp.	1650 Dierks Bldg., Kansas City 6, Mo.
	Peerless Stone Products, Inc.	Turner
	Thompson Strauss Quarries, Inc.	700 Holliday Drive, Kansas City
	Universal Atlas Cement Co.	100 Park Ave., New York 17, N.Y.

METALS

Lead and zinc are the only metals mined in Kansas; 43 mines operated by 26 producers in the southeast corner of Cherokee County, in the extreme southeast part of the state, produced zinc and all but one produced lead. In 1957 the value of metals produced was $4,896,790, which is $5,354,810 less than in 1956. The metals contributed 0.9 percent of the value of all minerals produced in the state (Table 4, Fig. 3).

Lead

Owing to the softening market and increase in imports and stocks, lead production in Kansas in 1957 was reduced to only 4,257 tons of recovered metal valued at $1,217,502, compared to 7,635 tons valued at $2,397,390 in 1956, a decrease of 44.3 percent in quantity and 49.3 percent in value. On record as having produced lead in 1957 are 42 mines operated by 20 companies and 5 gougers.

The National Lead Company of St. Louis was the principal lead producer in 1957, followed by the Eagle-Picher Mining and Smelting Company of Miami, Oklahoma. The only lead smelter operated in Kansas was the Eagle-Picher Mining and Smelting Company smelter at Galena, Cherokee County. This smelter treated ores not only from Kansas but also from the entire Tri-State District and some from Illinois. A lead pigment plant operated by the Ozark Smelting and Mining Company of Coffeyville, Montgomery County, was active during 1957.

Data on lead production in Kansas in 1956 and 1957 and a directory of lead producers on record as of December 31, 1957, are presented in Table 37 and 38 respectively.

TABLE 37.—*Quantity and value of lead produced in Kansas, 1956 and 1957*

Year	Concentrates (galena)		Recoverable metal (lead)	
	Tons	Value	Tons	Value
1956	10,130	$1,955,278	7,635	$2,397,390
1957	5,703	1,026,116	4,257	1,217,502
Percent change			—44.3	—49.3

ZINC

Zinc ranked tenth in value among Kansas minerals produced in 1957, although production decreased from 28,665 tons valued at $7,854,210 in 1956 to 15,859 tons valued at $3,679,288, a decline of 44.7 percent in quantity and 53.2 percent in value. During 1957, 21 companies and 5 gougers produced zinc from 43 mines.

As with lead, the National Lead Company of St. Louis was the largest zinc producer in the state, followed by the Eagle-

TABLE 38.—*Directory of lead and zinc producers in Kansas on record as of December 31, 1957*

Company or operator	Address	Mine*
Ajax Mining Co.	Joplin, Mo.	Hunter
B & I Mining Co.	Picher, Okla.	Florence Bailey
Bonanza Mining Co.	Picher, Okla.	Semple
Buffalo Mining Co.	Picher, Okla.	Tulsa
Carey-McCoy Mining Co.	Picher, Okla.	Sonny Boy
John Carmack	Baxter Springs	Homestake
Geo. W. Duncan	Baxter Springs	Race Track
The Eagle-Picher Mining & Smelting Co.	Miami, Okla.	Big John, Bilharz, Grace "B", Lucky Jew, Webber, Westside
Helen H. Mining Co.	Baxter Springs	Karcher-Stebbins
Charley King	Picher, Okla.	Thomas Cave
Little Ben Mining Co.	Baxter Springs	Clark, Keith
J. Robert Mason	Baxter Springs	Brewster
National Lead Co., St. Louis Smelting & Refining Division	Fredericktown, Mo.	Bailey, Ballard, Estes, Hartley, Moore, Mt. Hope, Shanks, Slaughter, Swalley, Thomas
C. H. Rea	Baxter Springs	Robinson
Roanoke Mining Co.	Picher, Okla.	Park-Hartley
Searcy-Henderson	Picher, Okla.	Stoskopf, Gendelari
Harold Sheeran Mining Co.	Joplin, Mo.	Cherokee, Chubb
Thunderbird Mining Co.	Baxter Springs	Brewster
Mark Twain Mining Co.	Picher, Okla.	Jarrett
Wesah Mining Co.	Miami, Okla.	Jarrett
Woods & Shira	Picher, Okla.	Thomas Cave
5 miscellaneous gougers		Various

* All lead and zinc mines are in Cherokee County.

Picher Mining and Smelting Company of Miami, Oklahoma. A zinc pigment plant at Cherryvale, Montgomery County, operated by the National Zinc Company, was active in 1957. The Cherryvale Zinc Company completed its new building at Cherryvale and added new equipment in expanding its operation of refining lead-tin minerals.

Data on zinc production in Kansas in 1956 and 1957 and a directory of zinc producers on record as of December 31, 1957, are presented in Tables 39 and 38 respectively.

TABLE 39.—*Quantity and value of zinc produced in Kansas, 1956 and 1957*

Year	Concentrates (sphalerite)		Recoverable metal (zinc)	
	Tons	Value	Tons	Value
1956	53,142	$4,688,130	28,665	$7,854,210
1957	29,189	2,311,401	15,859	3,679,288
Percent change			—44.7	—53.2

UNDISTRIBUTED MINERALS

Kansas produced several minerals that are classified as "undistributed". Undistributed mineral commodities are those whose total quantity and value cannot be revealed, because they are produced almost exclusively by one company. Such minerals in 1957 include diatomaceous marl, gypsum, natural cement, salt brine, volcanic ash or pumicite, and dimension sandstone. In addition, expanded perlite and expanded vermiculite were processed within recent years from material shipped into Kansas from outside sources. The total value of undistributed minerals in Kansas in 1957 amounted to $1,446,654.

CEMENT (NATURAL)

Natural cement has been produced in Kansas since 1869. The only producer in the state is the Fort Scott Hydraulic Cement Co., of Fort Scott in Bourbon County. Production and shipments of natural cement, as well as value, were 80 percent lower than those of 1956. The value of 1957 shipments of natural cement is included in the value listed under "Undistributed" in Table 1. Reserves of natural cement rock are practically unlimited.

Diatomaceous Marl

Diatomaceous marl is produced in Wallace County by the DeLore Division of the National Lead Company of St. Louis, Missouri. Production and value in 1957 were 3.6 percent less than in 1956. Value of diatomaceous marl is included in the total listed under "Undistributed" in Table 1.

The known deposits are estimated to exceed 1,000,000 tons.

Gypsum

Gypsum production in Kansas in 1957 declined approximately 12 percent in quantity of crude and calcined gypsum; value of crude gypsum decreased 19 percent and calcined gypsum 11 percent. The value of the crude gypsum produced is included under the value assigned to the "Undistributed" minerals (Table 1). Gypsum was produced in Barber and Marshall Counties. Producers on record at the end of 1957 are those listed in Table 40. The reserves of gypsum are known to be extensive; they are sufficient to maintain production at the present rate for many years.

Table 40.—*Directory of Kansas producers of gypsum in 1957*

County	Company	Office address	Mine or plant
Barber	National Gypsum	325 Delaware Ave., Buffalo, N.Y.	Medicine Lodge
Marshall	Bestwall Gypsum	120 E. Lancaster Ave., Ardmore, Penn.	Blue Rapids

Perlite and Vermiculite

Expanded perlite and expanded vermiculite were processed in Kansas from raw materials imported from other states. The quantity of expanded perlite sold in the state in 1957 was about the same as in 1956, but its value in 1957 was lower than in the previous year. Both quantity and value of expanded vermiculite showed decreases in 1957 as compared to 1956. Expanded perlite was processed by Panocalite Perlite, Inc., of Kansas City, Wyandotte County, and expanded vermiculite by the Dodson Manufacturing Company of Wichita, Sedgwick County. Values of perlite and vermiculite are included in the total listed under "Undistributed" in Table 1.

Pumicite or Volcanic Ash

In 1957, pumicite, or volcanic ash, was produced by two companies operating in Lincoln and Norton Counties. Production and value in 1957 were approximately the same as in 1956. Value is included in the total listed under "Undistributed" in Table 1. Kansas volcanic ash is extracted primarily for use in hand soap and cleaning and scouring compounds. Producers on record for 1957 are listed in Table 41.

Estimated reserves of pumicite or volcanic ash in Kansas approximate 9,700,000 tons.

Table 41.—*Directory of Kansas producers of pumicite, or volcanic ash, in 1957*

County	Company	Office address	Pit location (nearest town)
Lincoln	Ernest Hanzlicek	Wilson	Wilson
Norton	Wyandotte Chemical Corp.	1609 Biddle Ave., Wyandotte, Mich.	Calvert

Salt Brine

The Frontier Chemical Company of Kansas, Inc., Wichita, pumped brine from its salt brine wells in Sedgwick County near Wichita for use in the manufacture of industrial chemicals. Quantity and value of salt produced by this company in 1957 increased by approximately 40 percent from the preceding year. Value of the salt produced is included in the total listed under "Undistributed" in Table 1. Plans are underway for merging Frontier Chemical Company, which is a subsidiary of Union Chemical and Materials Company of Chicago, Illinois, with the Vulcan Materials Company of Birmingham, Alabama.

Sandstone (Dimension)

Dimension sandstone was produced by the Bandera Stone Quarry Company of 222 W. 72nd Street, Kansas City, Missouri. The quarry is located near Redfield in Bourbon County, Kansas. Production in 1957 is estimated to have been about the same as in 1956. The Bandera sandstone is used for building stone, including rough construction stone, sawed stone, and flagging stone. Value of dimension sandstone is included in the total listed under "Undistributed" in Table 1.

UNEVALUATED MINERAL RESOURCES

Water and Soil

Two of the most important mineral resources of Kansas are water, both surface and underground, and soil. Water and soil are truly mineral commodities, but because of their nature and universal usage are difficult to evaluate as to quantity and value. Water, to a considerable extent, is a replenishable resource in that water supplies may be completely replenished in some geologic situations and only partly replenished in others. Soil lost by erosion is replaced only by slow soil-building processes. No data are at hand at present in regard to the actual quantity of soil that exists in Kansas. Without the soil that covers the 82,113 square miles of land surface (total area including water surface is 82,276 square miles), Kansas could not have produced $1 billion to $1.5 billion worth of agricultural products including livestock each year since 1950. The amount of available water and the quantity used or consumed in the state in 1953 were estimated by the Kansas Water Resources Fact-Finding and Research Committee in 1954. According to the survey, a total of 1,898 mgd (million gallons a day) was withdrawn from the available water resources, but the amount consumed and removed from the supply for all purposes amounted to 652 mgd, or 237,980 million gallons per year. The actual value of the 237,980 million gallons consumed per year is not known. It is estimated (Foley, Smrha, and Metzler, 1955, p. 1) that city dwellers pay an average of only about $5 a year each for water, and rural residents somewhat less. On the assumption that 51 percent of the population is urban and 49 percent rural, the minimum value of water consumed is computed to be about $9,000,000 a year. This sum, however, does not include the value of water consumed by industry, which is estimated to pay an additional $27,000,000 a year, or about three-fourths of the state's water bill. The figures cited are not intended to be exact, but they do suggest the magnitude of the value of water consumed in Kansas each year.

UNEXPLOITED MINERALS

In addition to the minerals produced, there are other mineral commodities in Kansas that either have never been exploited or

are not at present being produced on a commercial scale. Such minerals include aluminum from clays (Kinney, 1943, 1952), bentonite (Kinney, 1942), chalk (Runnels and Dubins, 1949), of which the state has virtually unlimited supplies, iron (Jewett and Schoewe, 1942, p. 103), magnesium (Schoewe, 1943; Jeffords, 1948), mineral water (Schoewe, 1953, p. 133), oil shale (Runnels and others, 1952), phosphate nodules (Runnels, 1949; Runnels and others, 1953), pyrite (Jewett and Schoewe, 1942, p. 168), rock asphalt (Jewett, 1940), and tripoli (Jewett and Schoewe, 1942, p. 168). Still other minerals are known to occur in Kansas, such as germanium (Schleicher and Hambleton, 1954) and uranium (Runnels, Schleicher, and Van Nortwick, 1953), but these have not been investigated sufficiently to show whether they exist in commercial quantities. Further study of these unexploited minerals in Kansas coupled with favorable economic conditions may eventually result in the production of some, if not all, of these mineral commodities.

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