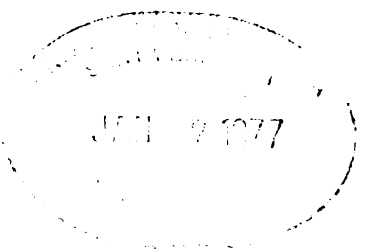
THE MINERAL INDUSTRY IN KANSAS IN 1955

By

WALTER H. SCHOEWE



State Geological Survey of Kansas, Bulletin 119, Part 8
University of Kansas Publications
Lawrence, Kansas
1956

STATE GEOLOGICAL SURVEY OF KANSAS, BULLETIN 119
1956 REPORTS OF STUDIES, PART 8, PAGES 267-320, FIGURES 1-3
DECEMBER 31, 1956

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ABSTRACT

Kansas in 1955 produced minerals valued at $487,896,694, a gain of 5.2 percent when compared to the value of the minerals produced in 1954. Of this amount the mineral fuels contributed $414,342,840, or approximately 85 percent; the nonmetals $65,120,945, or 13.3 percent; and the metals $8,432,909, or 1.8 percent. With the exception of coal, natural gasoline, and pumicite (volcanic ash), quantity and value of all other minerals produced in 1955 showed increases over 1954. Kansas produced 22 minerals in 1955. Of the 105 counties in the state, all but Greeley, Lane, Mitchell, Rawlins, and Wichita Counties reported mineral production and values, and 53 counties produced mineral commodities valued at $1,000,000 or more. Barton County led all other counties, its mineral production exceeding $40,000,000. Most important minerals produced in Kansas were oil, gas, cement, stone, natural gas liquids, clay and clay products, salt, sand and gravel, zinc, carbon black, coal, lead, helium, and pumicite. This report discusses the production and value of all minerals produced in the state in 1955 with comparison of production and value in 1954, and it includes directories of mineral producers, with the exception of oil and gas producers, on record as of December 31, 1955.

INTRODUCTION

Kansas' reputation as a mineral state is well indicated by the fact that since 1932 it has ranked among the upper 10 in the United States in the value of mineral commodities produced annually. Kansas produces 22 minerals commercially; 5 others are available but currently are not exploited; at least 6 other minerals are known to exist in the state but have not been studied sufficiently to determine their commercial possibilities; and at least 2 minerals are processed into useful mineral commodities from raw materials shipped into the state from outside sources. In 1955 Kansas produced minerals valued at $487,896,694, a gain of 5.2 percent over 1954. Table I presents data on annual mineral production in Kansas for 1954 and 1955, together with the rank of each mineral with respect to the other minerals produced in the state.

With the exception of lead and zinc, which are mined in Kansas in Cherokee County, in the southeast corner of the state, most other Kansas minerals are widespread in their occurrence in the state. Oil and gas have been or are being produced in 80 counties; sand and gravel production is listed among at least 75 counties; and stone is at present being produced in 41 counties. Although coal is currently being mined in only 8 eastern Kansas counties, it is known to occur and has been mined in at least 16 other

TABLE 1.—Quantity and value of Kansas mineral production, by commodities, 1954 and 1955

Commodity	Unit	1954 Quantity	1954 Value	1955 Quantity	1955 Value	Rank 1955
Carbon black	Pounds	54,328,515**	3,014,326	97,446,155	5,553,883	10
Cement (portland)	376-lb. bbl.	9,076,328**	23,874,176**	9,071,747	24,520,533	3
Cement (masonry)	376-lb. bbl.			382,523	1,333,504	15
Clay and clay products	Short tons		8,500,000		9,000,000	5
Coal	do	1,315,140*	5,444,680*	739,086	3,118,943	11
Helium	cu.ft.	37,530,000	593,162	42,749,600	662,619	17
Lead (recoverable content of ores, etc.)	Short tons	4,033	1,105,042	5,498	1,640,603	14
Natural gas	M cu.ft.	405,841,987	44,692,618	466,180,157	51,279,817	2
Natural gas liquids						
Natural gasoline	42-gal. bbl.	2,521,598	7,438,714	2,724,569	6,675,194	9
Propane	do	904,543	1,899,540	950,858	2,329,602	13
Butane	do	869,573	1,826,103	967,635	2,370,706	12
LPG	do	318,155	601,313	276,488	677,396	16
Petroleum (crude)	do	118,309,260	333,632,113	121,161,234	341,674,680	1
Pumicite (volcanic ash)	Short tons	23,433	92,899	2,320	59,710	18
Salt (common)	do	877,667	7,778,405	910,866	8,432,325	6
Sand and gravel	do	10,421,673	7,194,390	10,664,986	6,909,666	7
Stone	do	10,367,090	12,909,587*	12,446,885	15,887,269	4
Zinc (recoverable content of ores, etc.)	do	119,110	4,127,760	27,611	6,792,306	8
Undistributed (diatomaceous marl, gypsum, natural cement, perlite[b], dimension sandstone, expanded vermiculite[b])			1,368,695		1,617,788	
Total Value			463,657,696[c]		487,896,694[c]	

*Revised figures.
**Including masonry cement.
[b]Minerals processed but not mined in Kansas.
[c]Total adjusted to eliminate duplication in the value of clays and stone.

eastern Kansas counties and in 8 counties in the north-central part of the state. Likewise, salt and gypsum are widespread in Kansas, even though production at present is restricted to no more than 5 counties. All but 5 of the 105 counties in Kansas reported mineral production in 1955; only Greeley, Lane, Mitchell, Rawlins, and Wichita Counties reported none. In 1955 each of 53 counties produced minerals worth $1,000,000 or more. Barton County, which produced minerals valued at $40,907,066, led all other Kansas counties in 1955 as it did in 1954. Ellis and Russell Counties, each of which produced minerals valued between $30,000,000 and $40,000,000, were second and third in importance. In the $20,000,000 to $30,000,000 category were Butler, Rice, Grant, and Rooks, in order of rank. Counties each of which produced in 1955 mineral wealth valued between $10,000,000 and $20,000,000 were Stafford, Greenwood, Cowley, Graham, McPherson, Stevens, Allen, and Cherokee. Table 2 summarizes the range of value of the 1955 mineral production per county.

The counties that produced the greatest dollar value of minerals are those in which oil is found. Most of these are western Kansas counties, but Allen, Butler, Cowley, and Greenwood Counties are included. Among the counties producing minerals valued at $1,000,000 or more, Allen, Cherokee, Elk, Montgomery, Neosho, Reno, Shawnee, Wilson, and Wyandotte Counties derived their mineral wealth mainly from the nonfuel minerals. Counties that exploited the most different minerals (6 or 7) were Cowley, Sedgwick, and Wyandotte; of these, Wyandotte produced no oil (Fig. 1). A summary evaluation based upon mineral fuels and nonfuel minerals for Kansas counties in 1955 is presented in Table 3 and Fig. 2.

Sources of information—In compiling the information for this report many of the data were obtained from the tabulation sheets

TABLE 2.—*Range of value of 1955 mineral production per county*

Value of annual production, millions of dollars	Number of counties producing minerals valued in this range
40-50	1
30-40	2
20-30	4
10-20	8
1-10	38
0-1	47
no production	5

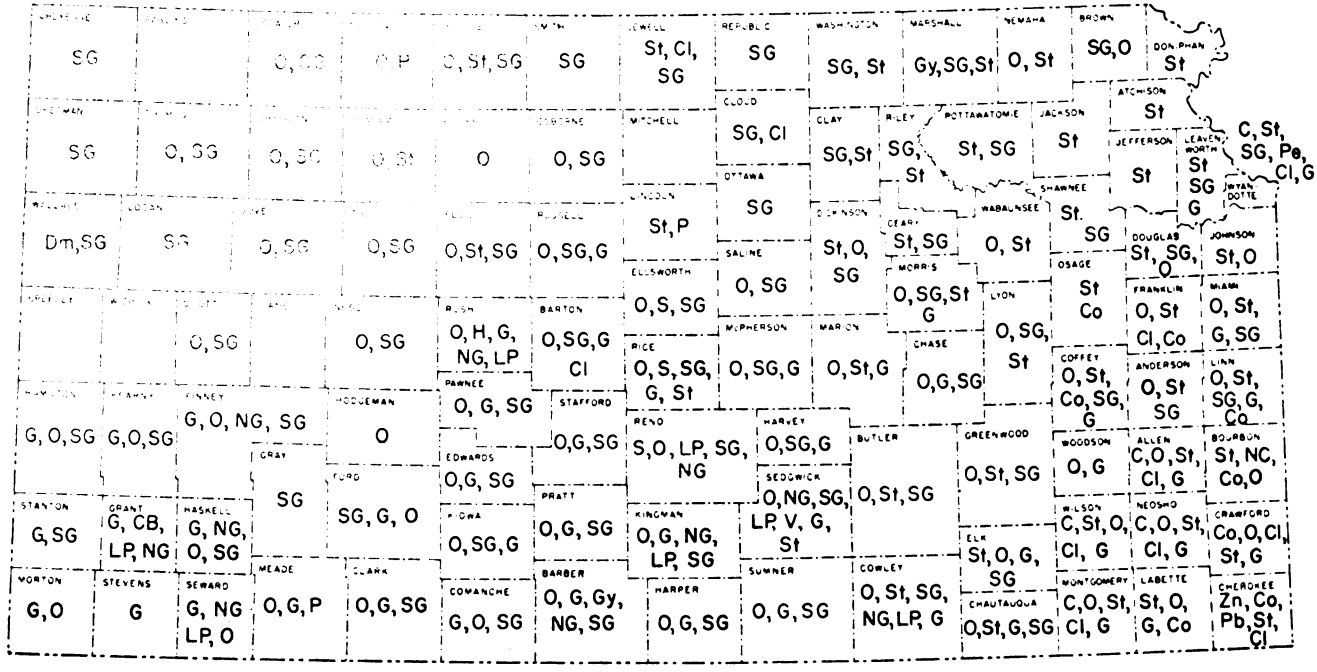

FIG. 1.—Map of Kansas showing mineral commodities produced in each county in 1955. Minerals are listed in order of value within counties. **C**—cement. **CB**—carbon black. **Cl**—clay. **Co**—coal. **Dm**—diatomaceous marl. **G**—natural gas. **Gp**—gypsum. **H**—helium. **LP**—liquefied petroleum gases. **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.

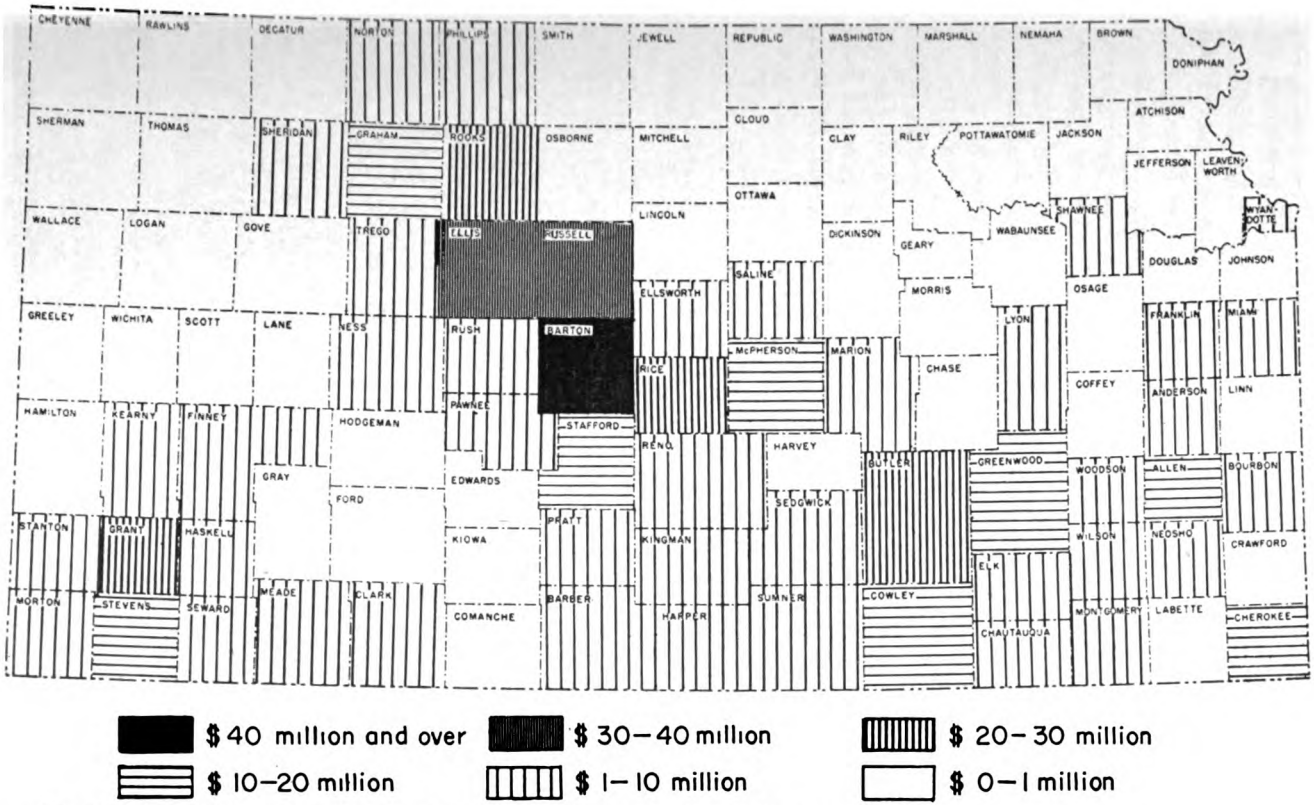

FIG. 2.—Map of Kansas showing range of value of 1955 mineral production per county.

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 of the Kansas Labor Department at Pittsburg, Kansas. Data pertaining to petroleum and related products were summarized from the reports by Ver Wiebe and others on Oil and Gas Developments in Kansas published as State Geological Survey Bulletin 112 and from the reports by Goebel and others on Oil and Gas Developments in Kansas published as State Geological Survey Bulletin 122. Many of the data on oil and gas production in these bulletins were supplied by the Kansas Corporation Commission, Conservation Division. Other data (regarding expansions, modernization, and the organization of new mineral producing companies) were obtained from the *Kansas Business Magazine* and *To The Stars*, the latter a publication of the Kansas Industrial Development Commission, Topeka, Kansas.

TABLE 3.—*Value of mineral production in Kansas by counties in 1955*

County	Value of mineral production			Commodities[c] in order of decreasing importance
	Fuels[a]	Nonfuels	Total	
Allen	$ 2,304,453	$ 8,448,048	$ 10,752,501	C, O, St, Cl, G
Anderson	2,065,413	177,000	2,242,413	O, St, SG
Atchison	...	384,927	384,927	St
Barber	6,734,051	*	*	O, G, Gp, NG, SG
Barton	40,606,694	300,372	40,907,066	O, SG, G, Cl
Bourbon	238,219	993,045	1,231,264	St, NC, Co, O
Brown	2,993	*	*	SG, O
Butler	23,883,646	375,182	24,258,828	O, St, SG
Chase	97,606	4,200	101,806	O, G, SG
Chautauqua	2,691,497	31,400	2,722,897	O, St, G, SG
Cherokee	2,495,079	8,824,999	11,320,078	Zn, Co, Pb, St, Cl
Cheyenne	...	*	*	SG
Clark	1,257,875	*	*	O, G, SG
Clay	...	70,863	70,863	SG, St
Cloud	...	341,250	341,250	SG, Cl
Coffey	545,502	*	*	O, St, Co, SG, G
Comanche	22,385	*	*	G, O, SG
Cowley	13,511,211	819,955	14,331,166	O, St, SG, NG, LP, G
Crawford	678,965	182,489	861,454	Co, O, Cl St, G
Decatur	991,524	*	*	O, SG
Dickinson	402,470	495,898	898,368	St, O, SG
Doniphan	...	420,570	420,570	St
Douglas	30,605	163,828	194,433	St, SG, O
Edwards	292,529	*	*	O, G, SG
Elk	895,740	1,617,252	2,512,992	St, O, G, SG
Ellis	31,487,796	*	*	O, St, SG
Ellsworth	8,593,175	879,050	9,472,225	O, S, SG

County	Value of mineral production			Commodities[c] in order of decreasing importance
	Fuels[a]	Nonfuels	Total	
Finney	4,819,825	106,061	4,925,886	G, O, NG, SG
Ford	34,963	105,300	140,263	SG, G, O
Franklin	1,066,644	286,242	1,352,886	O, St, Cl, Co
Geary	....	363,674	363,674	St, SG
Gove	85,378	*	*	O, SG
Graham	13,811,943	*	*	O, St
Grant	20,467,727	....	20,467,727	G, CB, LP, NG
Gray	....	*	*	SG
Greeley	....	....	....	None reported
Greenwood	18,287,805	*	*	O, St, SG
Hamilton	598,169	25,088	623,257	G, O, SG
Harper	1,691,423	*	*	O, G, SG
Harvey	667,975	*	*	O, SG, G
Haskell	4,710,616	*	*	G, NG, O, SG
Hodgeman	295,062	....	295,062	O
Jackson	....	*	*	St
Jefferson	....	*	*	St
Jewell	....	365,602	365,602	St, Cl, SG
Johnson	12,205	366,994	379,199	St, O
Kearny	7,186,953	*	*	G, O, SG
Kingman	4,778,096	*	*	O, G, NG, LP, SG
Kiowa	163,322	23,442	186,764	O, SG, G
Labette	292,023	296,789	588,812	St, O, G, Co
Lane	....	....	....	None reported
Leavenworth	2,131	558,549	560,680	St, SG, G
Lincoln	....	*	*	St, P
Linn	269,992	139,205	409,197	O, St, SG, G, Co
Logan	....	*	*	SG
Lyon	1,172,449	158,454	1,330,903	O, SG, St
Marion	2,584,167	*	*	O, St, G
Marshall	....	619,766	619,766	Gp, SG, St
McPherson	12,572,472	*	*	O, SG, G
Meade	1,629,478	*	*	O, G, P
Miami	1,912,253	151,973	2,064,226	O, St, G, SG
Mitchell	....	....	....	None reported
Montgomery	3,141,907	6,145,127	9,287,034	C, O, St, Cl, G
Morris	204,542	17,744	222,286	O, SG, St, G
Morton	6,984,561	....	6,984,561	G, O
Nemaha	76,081	*	*	O, St
Neosho	1,815,456	5,066,019	6,881,475	C, O, St, Cl, G
Ness	1,000,220	*	*	O, SG
Norton	2,913,122	*	*	O, P
Osage	39,925	*	*	St, Co
Osborne	232,018	*	*	O, SG
Ottawa	....	*	*	SG
Pawnee	7,233,401	75,356	7,308,757	O, G, SG
Phillips	5,564,277	386,705	5,950,932	O, St, SG
Pottawatomie	....	136,712	136,712	St, SG
Pratt	8,183,827	113,908	8,297,735	O, G, SG
Rawlins	....	....	....	None reported
Reno	3,637,282	6,086,403	9,723,685	S, O, LP, SG, NG
Republic	....	*	*	SG
Rice	19,256,019	1,808,779	21,064,798	O, S, SG, G, St
Riley	....	132,900	132,900	SG, St
Rooks	20,058,590	....	20,058,590	O
Rush	2,210,610	....	2,210,610	O, H, G, NG, LP

County	Value of mineral production			Commodities[c] in order of decreasing importance
	Fuels[a]	Nonfuels	Total	
Russell	30,380,416	*	*	O, SG, G
Saline	3,176,660	*	*	O, SG
Scott	241,995	*	*	O, SG
Sedgwick	7,876,524	1,183,074	9,059,598	O, NG, SG, LP, V, G, St
Seward	5,466,080	....	5,466,080	G, NG, LP, O
Shawnee	....	1,004,964	1,004.954	St, SG
Sheridan	997,713	77,546	1,075,259	O, SG
Sherman	....	30,314	30,314	SG
Smith	....	*	*	SG
Stafford	18,605,493	*	*	O, G, SG
Stanton	1,698,277	*	*	G, SG
Stevens	11,995.908	....	11,995,908	G
Sumner	8,046,180	*	*	O, G, SG
Thomas	17,436	19,279	36.715	O, SG
Trego	3,036,542	*	*	O, SG
Wabaunsee	432,365	*	*	O, St
Wallace	....	52,442	52,442	Dm, SG
Washington	....	125,149	125,149	SG, St
Wichita	....	....	....	None reported
Wilson	554,178	3,203,864	3,758,042	C, St, O, Cl, G
Woodson	2,435,437	....	2,435,437	O, G
Wyandotte	588	7,477,814	7,478,372	C. St, SG, Pe, Cl, G
Unassigned	....	8,676,707	7,676,707	Cl products, SG, St
Undistributed		3,224,155	182,411,023	
Kansas total	416.422,712	73,553,854	489,976,566[b]	

*Undistributed values may not be revealed.

[c]Commodities: 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.

[a]In assigning values of minerals produced in each county, the value of oil (fuels column) was computed on the average price of $2.82 per barrel (Table 1), even though it is realized that the price of oil varies with the gravity of oil produced and that therefore the actual value of oil in any one county may be greater or less than that computed on the $2.82 per barrel basis. 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 field has been applied to all Kansas gas production, including minor amounts of [illegible] production, much of which probably brought a higher price.

[b]Value not in agreement with similar values given in Tables 1 and 4. The discrepancy is due to the fact that the county breakdown of oil and gas production is based on a [illegible] basis. Table 3, which shows a higher total, is prepared for the county breakdown values, and the total production listed in Tables 1 and 4 is on [illegible] basis. Because of the numerous sources of data and bases of collection, total annual oil and gas production figures computed on a field basis differ from statewide totals computed on a tax basis.

THE MINERAL FUELS AND RELATED PRODUCTS

As in former years, the mineral fuels, coal, oil, natural gas, and the natural gas liquids, and related products (helium and carbon black) contributed the greatest share to the mineral wealth produced in Kansas in 1955. In that year they accounted for 84.9 per cent of the total value of minerals produced, or $414,342,840 (Table 4, Fig. 3).

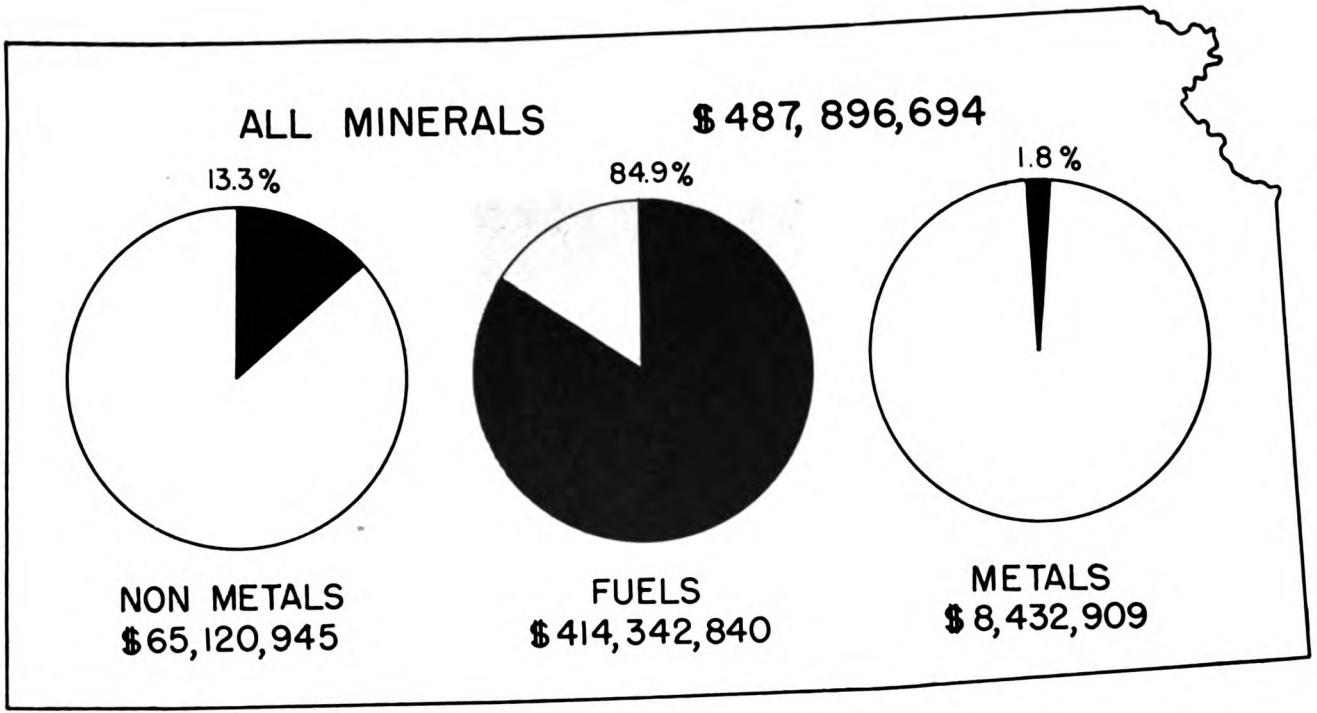

FIG. 3.—Percent and value of mineral production in Kansas, 1955.

Coal

Kansas, in 1955, produced 739,086 short tons of bituminous coal, or 576,054 tons less than it did in 1954, a loss of 43.8 per cent. As in 1954 most of the coal mined, 98.8 percent, came from strip mines. Coal, 11th in importance among the Kansas mineral commodities produced in 1955, was valued at $3,118,942, or 42.7 per cent less than it was in 1954, when the state coal was worth $5,444,680. In 1955 the estimated average price per ton was $4.22; in 1954 it was worth on the average $4.14 per ton.

Of the 8 coal producing counties, Cherokee and Franklin showed increases in production, whereas Bourbon, Coffey, Crawford, Labette, Linn, and Osage Counties each produced less coal than in the previous year. Sharpest decline in coal production was in Linn County, where production dropped from 435,947 tons in 1954 to a mere 452 tons in 1955 because of the abandonment of mining in the county by the Hume-Sinclair Coal Company. In previous years Linn County ranked either second or third in coal production in the state; in 1955 it was eighth, or last. Table 5 gives figures on Kansas coal production by type of mine and by counties, value of coal, rank by counties, and number of mines in 1954 and 1955.

The Pittsburg-Midway Coal Company operating in Cherokee County outranked all others of the 40 coal companies mining coal in the state. In 1955 this company produced 484,614 tons of strip coal, or 65.5 per cent of all coal mined in Kansas. The Apex-Construction Coal Company stripping coal in Cherokee and Crawford Counties was second in importance in this respect during the year. Of the 40 coal companies producing coal in 1955, 32 operated 33 strip mines, and 8 companies obtained their coal from shaft or underground mines. Of the 8 underground mining companies, the Lucky Star Coal Company of Crawford County ranked first with 4,251 tons of coal produced.

Measured and indicated coal reserves in Kansas to the end of 1955 are estimated at 1,118,630,000 tons, of which 838,772,500 tons are considered recoverable coal. On the basis of the average annual production of 1,548,372 tons of coal for 1951 to 1955, sufficient recoverable coal in Kansas is available to supply the state's need for more than the next 500 years.

Coal companies operating in Kansas on record December 31, 1955, are listed in Table 6.

TABLE 4.—*Value of minerals produced in Kansas in 1954 and 1955*

Year	Mineral fuels and associated products	Percent of total	Nonmetals (Excluding mineral fuels)	Percent of total	Metals	Percent of total	All minerals	Percent change from 1954
1954*	399,142,569	85.5	59,282,325	12.7	5,232,802	1.8	463,657,696	
1955	414,342,840	84.9	65,120,945	13.3	8,432,909	1.8	487,896,694	+5.2

*Revised figures.

TABLE 5.—*Kansas coal production by type of mine and by counties, value of coal, rank by counties, and number of mines, 1954 and 1955*

County	1954 Production, short tons Strip	Deep	Total	Value	1955 Production, short tons Strip	Deep	Total	Value	Rank 1954	Rank 1955	Number, 1955 Strip	Number, 1955 Deep
Bourbon	12,003		12,003	49,692	9,841		9,841	41,529	4	3	4	0
Cherokee	578,004		578,004	2,392,937	591,251		591,251	2,495,079	1	1	8	0
Coffey	2,834		2,834	11,733	2,147		2,147	9,060	6	5	2	0
Crawford	253,631	20,053	273,684	1,033,052	115,455	8,433	123,888	522,807	3	2	10	4
Franklin		731	731	3,026		1,048	1,048	4,423	8	6	0	1
Labette	1,277		1,277	5,287	998		998	4,212	7	7	1	0
Linn	435,678	269	435,947	44,132	452		452	1,907	28	8	1	0
Osage	6,468	4,192	10,660	44,132	4,392	5,069	9,461	39,925	5	4	6	3
All counties	1,289,895*	25,245	1,315,140*	5,444,680*	724,536	14,550	739,086	3,118,942			32	8
Percent	98.1	1.9	100		98.1	1.9	100					
					—43.8	—42.4	—43.8	—42.7				

*Revised figures.

TABLE 6.—*Directory of Kansas coal-mining companies on record as of December 31, 1955*

County	Coal company	Office Address
Bourbon	Brooks	Route 2, Pittsburg
do	Garrett	Route 2, Garland
do	Jones	Arcadia
do	Pellett	Route 5, Fort Scott
do	Wood	Route 1, Pleasanton
Cherokee	Apex-Compton	P.O. Box 267, Pittsburg
do	Black Diamond	Route 3, Pittsburg
do	Boyd	301 W. Walnut, Columbus
do	Markley	Route 2, McCune
do	Pittsburg-Midway	314 Natl. Bank Building, Pittsburg
do	Semple	Baxter Springs
do	Wilkinson	Weir
Coffey	Thorne	P.O. Box 171, Lebo
Crawford	Clemens	312 Globe Building, Pittsburg
do	Cliff Carr	Route 1, Mulberry
do	Davis	Cherokee
do	De Gasperi	Route 2, Pittsburg
do	Illner	802 N. Taylor, Pittsburg
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	Quality	Route 3, Girard
do	Savage	704 N. Water, Pitsburg
do	Target	P.O. Box 321, Mulberry
do	True Cherokee	Arma
Labette	Gallagher	P.O. Box 65, Oswego
do	Richards	Oswego
Linn	Fyock	Prescott
do	Hume-Sinclair	309 N. Maple, Butler, Mo.
do	La Cygne	La Cygne
do	Snow	Pleasanton
Osage	Linville & Son	P.O. Box 266, Carbondale
do	Osage	Osage City
do	Rogers	Lebo

OIL

In 1955, Kansas, the fifth ranking oil state in the nation, produced 2,851,974 more barrels of crude oil, or petroleum, than it did in 1954. Production in 1955 amounted to 121,161,234 barrels of oil valued at $341,674,680; in 1954 118,309,260 barrels of oil worth $333,632,113 (Table 7). Among the mineral commodities produced in the state oil is foremost. The 1955 quantity and value of oil produced when compared to that of 1954 was a 2.4 percent gain in both. The average price of crude oil in 1955 was $2.82 per barrel, the same as in the previous year.

TABLE 7.—*Petroleum or crude oil production in Kansas, 1954 and 1955*

Year	Production bbl.	Value	Price per bbl.	Percent change from previous year	
				Quantity	Value
1954	118,309,260	333,632,113	2.82	....	....
1955	121,161,234	341,674,680	2.82	+2.4	+2.4

The number of oil-producing counties in the state was 71 in 1955, one less than in 1954. Among the 10 leading oil-producing counties several changes are to be noted (Table 8).

TABLE 8.—*Ten leading oil-producing counties in Kansas, 1954 and 1955*

County	Production, bbl.		Rank	
	1954	1955	1954	1955
Barton	16,353,520	14,366,110	1	1
Ellis	11,366,975	11,165,885	2	2
Russell	11,195,338	10,772,297	3	3
Butler	8,757,870	8,469,378	4	4
Rooks	7,190,986	7,112,975	6	5
Rice	7,578,134	6,802,665	5	6
Stafford	7,148,225	6,564,369	7	7
Greenwood	6,141,476	6,485,392	8	8
Graham	.....	4,897,852	..	9
Cowley	4,363,797	4,712,727	9	10
McPherson	4,021,567	.....	10	

Rooks County, which in 1954 held sixth place, interchanged position with Rice County, which ranked fifth in 1954. Graham County, not included among the top 10 leading oil producers in 1954, replaced Cowley County for ninth place, moving the latter county to tenth position, and thereby deleting McPherson County, tenth in rank in 1954, from the 10 foremost oil-producing counties in Kansas in 1955. With the exception of Greenwood, Cowley, and McPherson Counties, all of the other 10 leading oil-producing counties showed losses in the annual quantity of oil produced in 1955 when compared to 1954. On the basis of estimated and recorded cumulative oil production, 13 counties have each produced more than 50,000,000 barrels of oil (Table 9). Butler County was the first important oil producing county in the state and still ranked fourth in annual production in 1955. In cumulative production it tops the list with a total production of 405,675,138 barrels of oil. Barton County is second, Russell third, and the others as shown in Table 9. It will be noted for Table 9 that Rooks

TABLE 9.—*Leading oil-producing counties in Kansas based upon recorded and estimated cumulative production (50 million barrels or more) to the end of 1955*

County	Cumulative production, bbl.	
	1954	1955
Butler	397,205,760	405,675,138
Barton	267,139,672	281,505,782
Russell	258,111,792	268,884,089
Rice	198,343,888	205,146,553
Greenwood	196,323,700	202,809,092
Ellis	169,738,638	180,904,523
McPherson	128,010,085	132,467,644
Stafford	90,036,561	96,600,930
Ellsworth	81,025,055	84,072,280
Cowley	78,825,053	83,537,780
Reno	76,953,650	78,087,485
Rooks	52,990,702	60,103,677
Sedgwick	56,463,102	58,600,750

County in 1955 with a cumulative oil production of 60,103,677 barrels has surpassed Sedgwick County with a total of 58,600,750 barrels.

Since records of its production have been kept, Kansas has produced, to the end of 1955, a recorded cumulative total of 2,642,681,506 barrels of crude oil valued approximately at $4,902,000,000.

Most of the larger oil fields are in western Kansas (Table 10). Of the 6 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. The Trapp field, in Russell and Barton Counties, which was discovered in 1936, is the largest oil field in the state in annual production as of 1955. The Kraft-Prusa field in Barton and Ellsworth Counties, which ranked second in importance in 1954, was replaced by the El Dorado field of Butler County in

TABLE 10.—*Leading oil fields in Kansas, 1954 and 1955*

Field, by 1955 rank	County	Annual production, barrels	
		1954	1955
Trapp	Russell, Barton	5,409,869	4,797,347
El Dorado	Butler	3,833,188	4,231,941
Kraft-Prusa	Barton, Ellsworth	4,681,172	4,096,114
Hall-Gurney	Russell, Barton	4,547,924	4,075,710
Chase-Silica	Rice, Barton, Stafford	4,114,824	3,282,046
Bemis-Shutts	Ellis	3,372,377	3,232,150

1955. Other large oil fields include the Hall-Gurney field, in Russell and Barton Counties, the Chase-Silica field in Rice, Barton, and Stafford Counties, and the Bemis-Shutts field in Ellis County. Production of these large oil fields for the years 1954 and 1955 is listed in Table 10.

Paralleling the annual increase in oil production in Kansas is the consumption of oil within the state. In 1955 Kansas consumed 76.9 percent of its production, or 2.3 percent more than in 1954 when 74.6 per cent of the oil produced was consumed. Imports and exports of oil from and to other states were increasing in 1955. In 1954 Kansas imported 24,966,516 barrels of crude oil, whereas in 1955 the imports amounted to 29,505,340 barrels, an increase of 18.2 percent. Exports in 1955 were 57,527,501 barrels, an increase of 2,559,012 barrels over the previous year, or a gain of 4.7 percent. Total quantity of oil accounted for in 1955 was 150,666,574 barrels of oil compared to 143,275,776 barrels of oil in 1954. Data on production, consumption, imports, exports, and total quantity of oil accounted for in 1954 and 1955 are listed in Table 11.

Even though oil production and consumption are increasing in Kansas, the proved oil reserves are steadily increasing primarily because of discovery of new oil pools and secondarily because of the revival of old fields. In 1955, 124 new oil fields were discovered, 6 of which produced both oil and gas (Table 12). In addition 9 abandoned oil fields were revived. Proved oil reserves

TABLE 11.—*Production, consumption, imports, and exports of crude oil in Kansas, 1954 and 1955*

Year	Production, bbl.	Consumption Quantity, bbl.	Consumption Percent of production	Imports, bbl.	Exports, bbl.	Total quantity production and imports, bbl.
1954	118,309,260	88,307,287	74.6	24,966,516	54,968,489	143,275,776
1955	121,161,234	93,139,073	76.9	29,505,340	57,527,501	150,666,574

TABLE 12.—*Crude oil reserves and oil fields discovered in Kansas in 1954 and 1955*
(American Petroleum Institute, 1954 and 1955)

Year	Reserves Million bbl.	Reserves Percent change from 1954	Oil fields discovered	Oil fields revived	Total
1954	978.5		122[a]	2	124
1955	998.1	+2.0	124[b]	9	133

[a]One field produced both oil and gas and 2 oil fields were revived.
[b]Six fields produced both oil and gas and 9 oil fields were revived.

in 1955 were estimated at 998.1 million barrels, or 2 percent more than in 1954 when the oil reserves were estimated at 978.5 million barrels (Table 12). Counties in which new oil fields were discovered in 1955 are those listed in Table 13.

During 1955 a number of oil refineries and pipe line companies planned, started, and in some cases completed expansion and modernization of their facilities and built new pipe lines. The Shallow Water Refining Company of Garden City, whose refinery at Shallow Water in Scott County has been shut down since September 1, 1954, leased its plant to the Century Refining Company of Garden City. Runs were started on January 1, 1955, after the plant had been completely modernized. The capacity now averages 1,500 barrels per day. A number of refining companies, notably the Derby Refining Company, Wichita; Phillips Petroleum Company, Fairfax Industrial District, Kansas City, Kansas; the El Dorado Refining Company, El Dorado; Skelly Oil Company, El Dorado; National Co-operative Refinery, McPherson; and the Anderson-Prichard Oil Corporation, Arkansas City, have all expanded their facilities to produce or upgrade gasoline to a 100 octane rating for motor fuel. Because of the expansion program of these refining companies, whose investments have cost more than $5,000,000, the daily output of high octane gasoline has been increased by more than 32,000 barrels.

The Great Lakes Pipe Line Co., Okan Pipe Line Co., National Co-operative Refinery Association, and Panhandle Eastern Pipe Line Co. constructed in 1955 more than 200 miles of new pipe lines ranging from 8 inches to 24 inches in diameter. These new lines are used to transport crude oil, natural gas, and natural gasoline. In December permission was granted the Kansas Power and Light Company to lay a 17½ mile 12-inch gas pipe line in Kingman and Harper Counties. The pipe line, estimated to cost over $350,000, is to gather gas from gas wells in the two counties for its compressor station at Calista in Kingman County.

Many major oil companies operate in Kansas, as do numerous independent oil companies and operators, whose number changes from year to year. For this reason no directory of oil companies is included in this report.*

*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 the Morrison Petroleum Directory of Kansas published annually by John H. Morrison, Box 191, Wichita, Kansas.

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

TABLE 13.—*Counties and number of oil and gas fields discovered and number of revived fields in each in Kansas in 1955*

County	Number of fields discovered				
	Oil	Gas	O.G.	Total	Revived
Barber	7	3		10	1*
Barton	11		1	12	
Butler	1			1	1
Chautauqua	2			2	1
Clark		1		1	
Comanche	1	1		2	
Cowley	5			5	1
Decatur	2			2	
Dickinson	1			1	
Edwards	1	1		2	
Elk	4			4	
Ellis	5			5	1
Ellsworth	2			2	
Greenwood	1			1	
Graham	17			17	
Hamilton	1			1	
Harper	1	1	1	3	
Kingman	7	3	3	13	
Kiowa	4	2	1	7	
McPherson	2			2	
Marion	2			2	
Meade	1	2		3	
Morris	1	1		2	
Morton		2		2	
Ness	2			2	
Pawnee	5	2		7	
Pratt	2	2		4	
Reno	3			3	
Rice	3	1		4	
Rooks	4			4	1
Rush	1	1		2	
Sedgwick	4			4	2
Seward		2		2	
Sheridan	3			3	
Stafford	4			4	1
Sumner	4			4	1
Trego	2			2	
Wilson	1			1	
Woodson	1			1	
Total	118	25	6	149	10

*Gas, all others oil fields.

TABLE 14.—*Directory of petroleum refineries in Kansas on record as of December 31, 1955*

Refinery	Office Address	County
Anderson-Prichard Oil Corp.	Arkansas City	Cowley
Century Refining Company[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
Missouri Farmers Assn. (M.F.A.)	Chanute	Neosho
National Cooperative Refinery 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-Vacuum Oil Company	P.O. Box 546 Augusta	Butler
Standard Oil Company	1101 Illinois Neodesha	Wilson
Vickers Petroleum Company	Wichita[b]	Sedgwick

[a]Successor to Shallow Water Refining Company. Refinery at Shallow Water, Scott County.

[b]Refinery at Potwin, Butler County.

NATURAL GAS

Nationwide, Kansas ranks fifth as a producer of natural gas, second most valuable mineral produced in the state. In 1955, Kansas produced 466,180,157,000 cubic feet of natural gas valued at $51,279,817, or 14.9 percent more in both quantity and value than it did in 1954 when 405,841,987,000 cubic feet of gas valued at $44,642,618 were produced (Table 15). Cumulative natural gas production in Kansas from the first recorded production to the close of 1955 is estimated at 3,890,035,147 thousand cubic feet of natural gas.

TABLE 15.—*Natural gas production in Kansas, 1954 and 1955*

Year	Production (Mcu.ft. @ 14.65 p.s.i.a)	Value	Price, cents per cu.ft.	Percent change from previous year	
				Quantity	Value
1954	405,841,987	44,642,618	11		
1955	466,180,157	51,279,817	11	+14.9	+14.9

TABLE 16.—*Production of natural gas in the Hugoton Gas Area, Kansas, 1954 and 1955*

Year	Production M cu.ft. (14.65 psia)	Value	Percent change		Percent of state total production
			Quantity	Value	
1954	346,732,192	38,140,541			85.4
1955	394,247,153	43,368,287	+13.7	+13.7	84.6

Of the total amount of gas produced in 1955 in the state, 84.6 percent, or 394,257,153 thousand cubic feet, came from the Hugoton Gas Area comprising all or part of Finney, Grant, Hamilton, Haskell, Kearny, Morton, Seward, Stanton, and Stevens Counties, all of which are in southwestern Kansas (Table 16). Natural gas was produced in 48 counties in 1955, the same number as in 1954. Each of thirteen counties (Table 17) produced two billion cubic feet of gas or more in 1955. Of these counties Stevens with 109,053,705 thousand feet of gas was easily foremost. Barton County, which in 1954 produced more than two billion cubic feet of gas, failed to produce as much in 1955. Rush County, however, not in the list of the two billion cubic feet producers in 1954 replaced Barton County with a production of 2,694,780 thousand cubic feet of gas in 1955. On the basis of cumulative production of natural gas several changes in rank in 1955 when compared to 1954 are to be noted. Morton County, which in 1954 ranked sixth in cumula-

TABLE 17.—*Production of natural gas in Kansas counties producing 2 billion cubic feet or more annually, 1954 and 1955*

County	Production M cu.ft (14.65 psia)		Rank	
	1954	1955	1954	1955
Stevens[a]	93,253,317	109,053,705	1	1
Grant[a]	75,765,639	84,458,345	2	2
Morton[a,b]	47,822,615	60,040,584	4	3
Kearny[a]	61,466,542	59,523,103	3	4
Finney[a]	28,048,734	34,013,718	5	5
Haskell[a]	25,528,913	32,768,432	7	6
Seward[a,b]	26,095,598	30,294,960	6	7
Stanton[a]	13,780,190	15,438,885	8	8
Barber	8,970,191	12,419,721	9	9
Hamilton[a]	4,436,105	5,196,385	10	10
Pawnee	3,934,660	4,774,478	11	11
Meade	3,482,797	2,781,061	12	12
Rush	.....	2,694,780	....	13
Barton	2,170,590	.....	13	....

[a]Hugoton Gas Area counties.

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

TABLE 18.—*Leading gas-producing counties in Kansas based on estimated and recorded cumulative production to end of 1955*

County	Production M cu.ft. (14.65 psia)	Rank 1954	Rank 1955
Stevens[a]	1,376,626,786	1	1
Grant[a]	697,226,348	2	2
Kearny[a]	467,553,533	3	3
Morton[a,b]	268,368,882	6	4
Haskell[a]	251,148,182	5	5
Barber	241,896,019	4	6
Finney[a]	213,810,531	7	7
Seward[a,b]	183,211,171	8	8
Stanton[a]	90,309,329	9	9
Rice	32,571,390	10	10
Pawnee	27,234,408	11	11
Barton	21,754,705	12	12
Hamilton[a]	17,982,317	14	13
Pratt	15,981,566	13	14

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

tive production, advanced to fourth place in 1955; Barber County dropped from fourth place to sixth; Hamilton County, fourteenth in 1954, interchanged positions with Pratt County, which in 1954 ranked thirteenth. Table 18 shows the cumulative gas production and rank of the leading Kansas counties.

The reserves of natural gas, like those of oil, increased in 1955, owing to the continued discovery of new gas fields. In 1955, 31 new fields were discovered, 6 of which produced both gas and oil. In addition one abandoned gas field was revived during the year. In 1954 Kansas was credited with 23 newly discovered gas fields and 2 revived fields. Natural gas reserves in 1955 are estimated at 16,293,080 million cubic feet, or 3.4 percent more than in 1954 when 15,758,332 million cubic feet of gas constituted the quantity of natural gas in reserve in the state (Table 19).

TABLE 19.—*Natural gas reserves and gas fields discovered in Kansas, 1954 and 1955*
(American Gas Association, 1954 and 1955)

Year	Reserves Million cu.ft.	Percent change from previous year	Gas fields discovered	Gas fields revived	Total
1954	15,758,332		23[a]	2	25
1955	16,293,080	+3.4	31[b]	1	32

[a]Two fields produced both gas and oil and two gas fields were revived.
[b]Six fields produced both gas and oil and one gas field was revived.

Consumption of natural gas in Kansas increased 2.3 percent when compared to that of 1954. In 1955 Kansas consumption of natural gas was 319.2 billion cubic feet, or 68.7 percent of the state's total production. In the previous year state consumption amounted to 269.3 billion cubic feet of gas, or 66.4 percent of the Kansas production. As in previous years, natural gas was imported and exported. Imports in 1955 were 66.1 billion cubic feet of gas and exports 213.1 billion cubic feet. In 1954, imports were 65.5 billion cubic feet of gas and exports 202 billion cubic feet. Data on production, consumption, percent consumed, imports, and exports of natural gas in Kansas in 1954 and in 1955 are presented in Table 20.

TABLE 20.—*Production, consumption, imports, and exports of natural gas in Kansas, 1954 and 1955*

Year	Production billion cu.ft.	Consumption		Imports billion cu.ft.	Exports, billion cu.ft.	Total quantity production and billion cu.ft.
		Quantity billion cu.ft.	Percent of production			
1954	405.8	269.3	66.4	65.5	202.0	471.3
1955	466.2	319.2	68.7	66.1	213.1	532.3

NATURAL GAS LIQUIDS

Production and value of natural gas liquids, consisting of natural gasoline, propane, butane, and other miscellaneous liquefied gases, increased by 6.6 and 2.4 percent respectively in 1955 over 1954. In 1955 the total quantity of natural gas liquids amounted to 4,919,550 barrels valued at $12,052,898, whereas in the previous year production was 4,613,869 barrels worth $11,765,670 (Table 21). With the exception of miscellaneous natural gas liquids, all others showed increased production in 1955, and natural gasoline was the only one whose value was less than it was in 1954. The estimated average price per barrel of all natural gas liquids in 1955 was $2.45; in 1954 natural gasoline averaged $2.95 per barrel; propane and butane, $2.10 per barrel; and other miscellaneous LPG, $1.89.

Proved reserves of natural gas liquids declined by 1.1 percent in 1955 when compared to those of 1954. In 1955 Kansas' proved natural gas liquid reserves totaled 173.2 million barrels and in the previous year 175.2 million barrels.

TABLE 21.—*Production and value of liquefied petroleum gases (LPG) in Kansas in 1954 and 1955*

LPG	1954		1955	
	Quantity, bbl.	Value	Quantity, bbl.	Value[d]
Natural gasoline	2,521,598	7,438,714[a]	2,724,569	6,675,194
Propane	904,543	1,899,540[b]	950,858	2,329,602
Butane	869,573	1,826,103[b]	967,635	2,370,706
Other LPG	318,155	601,313[c]	276,488	677,396
All liquid hydrocarbons	4,613,869	11,765,670	4,919,550	12,052,898
Percent change from 1954			+6.6	+2.4

[a]Estimated average price $2.95 per barrel.
[b]Estimated average price $2.10 per barrel
[c]Estimated average price $1.89 per barrel.
[d]Estimated average price $2.45 per barrel.

Natural gasoline and liquefied petroleum gases were procured by 14 companies in 16 plants located in 12 counties. Plants on record as of December 31, 1955, are listed in Table 22.

TABLE 22.—*Directory of Kansas plants producing natural gasoline and liquefied petroleum gas on record as of December 31, 1955*

Plant location		
County	Town	Company
Barber	Medicine Lodge	Kansas Power & Light Company
Barton	Pawnee Rock	A. R. Jones Oil & Operating Company
Cowley	Atlanta	The Texas Company
Finney	Holcomb	Northern Natural Gas Company
Grant	Ulysses	Hugoton Production Company
do	do	Magnolia Petroleum Company
do	do	Stanolind Oil and Gas Company
Haskell	Sublette	Northern Natural Gas Company
Kearny	Lakin	Colorado Interstate Gas Company
do	Deerfield	Deerfield Petroleum, Inc.
Kingman	Cunningham	Skelly Oil Company
Pratt	Burton	Cities Service Oil Company
Rush	Otis	Dunn-Mar Oil and Gas Company
Sedgwick	Wichita	Cities Service Oil Company
do	Cheney	Drillers Gas Company
Seward	Liberal	Panhandle Eastern Pipe Line Company

HELIUM

In 1955 Kansas produced 42,749,600 cubic feet of helium valued at $662,619. In quantity and in value the helium produced in the state amounted to gains of 13.9 percent and 11.7 percent respectively when compared to production and value in 1954 (Table 23). In value helium ranks 17th in the state. The

TABLE 23.—*Quantity and value of helium produced in Kansas, 1954 and 1955*

Year	Quantity, cu.ft.	Value	Percent change from 1954	
			Quantity	Value
1954	37,530,000	593,162		
1955	42,749,600	662,619	+13.9	+11.7

production and price of helium are controlled by the Federal Government. In addition to Federal agencies, such as the Army, Navy, Air Force, and Weather Bureau, which purchase and use most of the helium produced, other customers of the United States Bureau of Mines, which sells the helium, include commercial concerns that distribute the gas for use in arc welding, the practice of medicine, and many types of research work. Federal agencies pay $12.00 per 1,000 cubic feet of helium gas at the production plants. Other users pay $13.50 at the plant and an additional $2.00 per 1,000 cubic feet for delivery in standard cylinders.

The helium was produced at the United States Bureau of Mines plant at Otis in 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

Carbon black, produced in Kansas since 1937 and used in the manufacture of rubber and as a pigment in paints and inks, was produced by three companies in 1955. Production in that year amounted to 97,446,155 pounds, or 43,117,640 pounds more than in the previous year when 54,328,515 pounds were produced. The 1955 increase was 89 percent. In value, the 1955 quantity was 84.2 percent more than it was in 1954, the 1955 value being $5,553,883 and the 1954 value $3,014,326 (Table 24). Carbon black ranked tenth in value among the mineral commodities produced in the state. It is estimated that 10.9 billion cubic feet of gas were consumed in the manufacture of carbon black in Kansas in 1955 and 8.9 billion cubic feet of gas in 1954.

TABLE 24.—*Quantity and value of carbon black produced in Kansas, 1954 and 1955*

	Quantity, lb.	Value	Percent change from 1954		Estimated gas consumed, billions of cu.ft. (cu.ft. at 14.65 psia)
			Quantity	Value	
1954	54,328,515	3,014,326			8.9[a]
1955	97,446,155	5,553,883	89	84.2	10.9[b]

[a]Ver Wiebe and others, Table 9, p. 28.
[b]Goebel and others, 1956, Table 9, p. 32.

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

NONMETALLIC MINERALS

In 1955 the value of the annual production of nonmetallic minerals—cement, clay, gypsum, pumicite (volcanic ash), salt, sand and gravel, and stone—was $65,120,945, or 13.3 percent of the total value of all minerals produced in the state (Table 4, Fig. 3).

Raw materials for the making of cement and other purposes are available in unlimited amounts. See statements on reserves for stone, clay, gypsum, and sand and gravel.

PORTLAND CEMENT

Production of portland cement in Kansas in 1955 amounted to 9,219,3[illegible] barrels, a gain of 4.7 percent over the 1954 production. Shipments of the cement in 1955 were 9,071,747 barrels, or almost the same as in the previous year, although the value of the shipments advanced from $23,874,176 in 1954 to $24,520,533 in 1955, an increase of 2.7 percent. The average price per barrel of shipped portland cement in 1955 was $2.70, 7 cents more than in 1954. Stocks on hand December 31, 1955, were 532,483 barrels, or 60,655 more barrels of cement than the year previous. Portland cement is third in importance among the minerals produced in Kansas. Data pertaining to this cement are presented in Table 25.

TABLE 25.—*Production and shipments of portland cement in Kansas in 1954 and 1955, in 376-pound barrels*

Year	Production	Shipments	Value		Percent change from 1954	
	Barrels		Total	Average	Quantity	Value
1954	8,803,007	9,076,328	23,874,176	2.63		
1955	9,219,533	9,071,747	24,520,533	2.70	—0.06	+2.7

Portland cement in Kansas is produced by 6 companies operating in 5 counties. Allen County leads in the production and shipment of this mineral commodity in the state followed by Montgomery County. In addition to portland cement, each of the 6 cement companies produced and shipped masonry cement totaling 382,523 barrels of cement valued at $1,133,504, and one company, the Fort Scott Hydraulic Cement Company, Fort Scott, Bourbon County, produced natural cement. Its production is included under the "undistributed" minerals in Table 1.

Two of the cement companies in Kansas spent a considerable amount of money during the year in expanding and remodeling their plants. The Lone Star Cement Corporation at Bonner Springs, Wyandotte County, installed a new kiln boosting its capacity by 660,000 barrels of cement to 2,260,000 barrels per year. The expansion and rehabilitation program of the Consolidated Cement Corporation at Fredonia, Wilson County, included a 425 foot kiln and additional grinding equipment. Total capacity of the plant has been increased to 2,300,000 barrels of cement per year. Portland cement producers on record as of December 31, 1955, are listed in Table 26.

TABLE 26.—*Directory of portland cement producers in Kansas, 1955*

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

Clay and Shale

Total clay and shale sold or used by producers in 1955 was approximately 10 percent greater than it was in 1954. In value the 1955 increase was still greater, or 12 percent (Table 27). Kansas clay or shale produced consists of fire clay and miscellaneous clay (including shale used for cement), the former being produced in Barton and Cloud Counties, the latter in Allen, Cherokee, Crawford, Franklin, Montgomery, and Wilson Counties. Fire clay production in 1955 when compared to that produced in 1954 increased 31.3 percent in quantity and 53.6 percent in value, whereas miscellaneous clay in the same period increased less than 1 percent (0.6) in tonnage and 6 percent (5.97) in value. Clay used for cement increased in quantity and in value in 1955 from 328,741 tons and dollars in 1954 to 396,870 tons and dollars in 1955, or 20.7 percent. In 1955, 13 companies operating in 11 counties produced clay or shale. Disregarding clay used for cement, Cloud and Wilson Counties led all other counties in clay or shale production in 1955, whereas in 1954 Crawford and Franklin Counties held first and second place respectively. Kansas clay or shale is used primarily for the manufacture of brick (of which 118,707,000 were produced in 1955), tile, cement, and lightweight aggregate. Raw clay or shale ranked 15th among mineral commodities produced in 1955 and 5th if clay products are included.

Kansas added two new brick plants, one tile plant, and one chinaware plant during 1955. In June the Great Bend Brick and Tile Company of Great Bend, Barton County, started construction of its new $400,000 brick plant at Kanopolis, Ellsworth County. This new plant, which will employ the tunnel type of kiln

Table 27.—*Clay or shale sold or used by producers in Kansas, 1954 and 1955*

	Clay or shale used						Clay and clay products
	Brick, tile, lightweight aggregate		Cement		Total		
Year	Tons	Value	Tons	Value	Tons	Value	
1954	368,641	449,106	328,741	328,741	697,382[a,b]	777,847	8,500,000
1955	370,792	476,146	396,870	396,870	767,662[a]	873,016	9,000,000
Percent increase from 1954	0.6	6.0	20.7	20.7	10.1	12.2	5.8

[a]Excludes certain clays, value of which is included with clay and clay products.
[b]Revised figures.

TABLE 28.—*Directory of clay and shale producers in Kansas in 1955*

County	Company	Office Address	Pit location	Type of plant[a]
Allen	Humboldt Brick & Tile Co.	Humboldt	Humboldt	B
do	United Brick & Tile Co.	207 Pickwick Bldg., Kansas City 6, Mo.	Iola	B
Barton	Great Bend Brick & Tile Co.	Great Bend	Great Bend	B
do	Kansas Brick & Tile Co.	Hoisington	Hoisington	B
do	Great Bend Brick & Tile Co.	Great Bend	Kanopolis	B
Bourbon	Pidgeon Vitrified China Co.	Fort Scott	Fort Scott	P
Cherokee	United Brick & Tile Co.	207 Pickwick Bldg., Kansas City 6, Mo.	Weir	B
Cloud	Cloud Ceramics	Concordia	Concordia	B
Cowley	Pomona Tile Mfg. Co.	Pomona, California	Arkansas City	B
Crawford	W. S. Dickey Clay Mfg. Co.	607-617 Commerce Trust Bldg., Kansas City 6, Mo.	Pittsburg	B
Ellsworth	Dryden Pottery	Ellsworth	Ellsworth	P
Franklin	Buildex, Inc.	312 Globe Bldg., Pittsburg, Kansas	Ottawa	A
Montgomery	United Brick & Tile Co.	207 Pickwick Bldg., Kansas City 6, Mo.	Coffeyville	B
do	Ludowici-Celadon Co.	75 East Wacker Drive, Chicago 1, Illinois	Coffeyville	B
Wilson	Acme Brick Co.	Fort Worth, Texas	Buffalo	B
do	Excelsior Brick Co.	P.O. Box 32, Fredonia	Fredonia	B

[a]A, aggregate; B, brick, tile; P, pottery.

instead of the beehive type, will have a capacity of 40,000 brick per day. The Kansas Brick and Tile Company at Hoisington, Barton County, was the newest and most modern brick plant in the state in 1955. Current production capacity is rated at a million brick per month with exceptions of increasing the output to two million brick per month in the near future. Equipment includes a tunnel type of kiln and dryer, and four 30-foot round downdraft kilns capable of burning about 85,000 brick at a time each 10 days. The new tunnel kiln is capable of producing 2,000 finished brick every hour and fifteen minutes. Improvements and modernization of plants were undertaken by the Great Bend Brick and Tile Company at Great Bend, Barton County, by installing its eighth and newest kiln to increase production by 20 percent. The W. S. Dickey Clay Manufacturing Company at Pittsburg, Crawford County, added drying rooms and a straightline tunnel kiln at an estimated cost of $700,000 to increase its production of 20,000 tons per year. The Pomona Tile Manufacturing Company of Pomona, California, constructed a new plant at Strother Field midway between Arkansas City and Winfield, Cowley County. In August the Humboldt Brick and Tile Company at Humbolt, Allen County, put into operation its new shale planer in obtaining its raw materials for the making of brick. The Pidgeon Vitrified China Company of Fort Scott, Bourbon County, successor to the Fort Scott Pottery Company and manufacturer of chinaware chiefly for hotels and cafes, has completely modernized its plant, which is now reported to be the most modernly equipped pottery in the nation. Producers of clay or shale in Kansas in 1955 are listed in Table 28.

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 high-grade clays are estimated to be at least 125 billion tons.

Pumicite or Volcanic Ash

Pumicite, or volcanic ash, was produced in Kansas in 1955 in Lincoln, Meade, and Norton Counties by four companies. Production in 1955 amounted to 2,320 tons valued at $59,710, a decrease of 21,113 tons and $33,189 respectively when compared to production and value in 1954 (Table 29). The big decrease in pumicite production in 1955 is accounted for by the fact that in

TABLE 29.—*Pumicite or volcanic ash production and value in Kansas in 1954 and 1955*

Year	Production		Percent change from 1954	
	Quantity, tons	Value	Quantity	Value
1954	23,433	92,899		
1955	2,320	59,710	—90.1	—35.8

1954 over 21,000 tons of crude pumicite were used in the rebuilding of Kansas highways. Of the 2,320 tons of pumicite produced during the year, 1,387 tons, or 59.8 percent, were used or sold as prepared pumicite, and the remaining 933 tons, or 40.2 percent, as crude. Prepared pumicite production in 1955 was practically twice that of 1954. In May 1955 the Cudahy Packing Company's silica mine in Meade County was sold to the Purex Corporation, Ltd., of Meade, Kansas. Producers on record in 1955 are listed in Table 30.

Estimated reserves of pumicite, or volcanic ash, in Kansas approximate 9.7 million tons.

TABLE 30.—*Directory of Kansas producers of pumicite, or volcanic ash, in 1955*

County	Company	Office Address	Pit location nearest town
Lincoln	Ernest Hanzlicek	Wilson	Wilson
Meade	The Cudahy Packing Co.	Union Stock Yards Omaha 7, Nebraska	Meade
do	Purex Corp., Ltd.	Meade	Meade
Norton	Wyandotte Chemical Corp.	Wyandotte, Michigan	Calvert

SALT

Salt production in Kansas in 1955, both evaporated and rock salt, was greater than it was in 1954. The total quantity mined amounted to 901,284 tons valued at $8,432,325, an increase when compared to that of 1954 of 3.7 percent in tonnage and 8.4 percent in value (Table 31). Evaporated salt, 361,612 tons, showed an increase of 3 percent in quantity and 4.4 percent increase in value when compared to tonnage and value in 1954. Rock salt production in 1955 was 549,254 tons, or 5.4 percent greater than in 1954, and in value 13.3 percent more than in the preceding year. Rock salt, as in former years, still led in tonnage, whereas in value evaporated salt in 1955 exceeded the 1954 value by $3,206,747, or

TABLE 31.—*Salt sold or used by producers in Kansas in 1954 and 1955, in short tons*

Year	Evaporated salt		Rock salt		Total	
	Tons	Value	Tons	Value	Tons	Value
1954	357,045	5,474,150	520,622	2,304,255	877,667	7,778,406
1955	361,612	5,819,536	549,254	2,612,789	910,866	8,432,325
Percent increase 1955 vs. 1954	3	4.4	5.4	13.3	3.7	8.4

by 122.7 percent. Salt was produced by five companies operating in three counties, Ellsworth, Reno, and Rice, with Rice County leading in production. In addition to the regular commercial salt producing companies, the Frontier Chemical Company of Kansas, Inc., at 321 W. Douglas Street, Wichita, produces its own salt from wells near Wichita for use in the manufacture of industrial inorganic chemicals. As in former years, salt ranked sixth in value of all minerals produced in the state.

Kansas salt reserves for practical purposes are inexhaustible. In 1942 the state's salt reserves were estimated to be over 5,000 billion tons, an amount sufficient to supply the entire United States for a period of more than one-half million years. Since that estimate was made Kansas has produced less than 5 million tons of salt, an amount barely affecting the original estimate made in 1942. The five salt companies that operated in Kansas in 1955 are listed in Table 32.

TABLE 32.—*Directory of salt-producing companies in Kansas in 1955*

County	Company	Office Address	Location of mine or well	Type of plant
Ellsworth	Independent Salt Co.	4115 Packers Ave. Chicago 9, Illinois	Kanopolis	Rock
Reno	The Barton Salt Co.	Hutchinson	Hutchinson	Evaporated
do	The Carey Salt Co.	do	Hutchinson	Rock
do	Morton Salt Co.	120 S. La Salle Chicago 3, Illinois	do	Evaporated
Rice	American Salt Co.	630 New York Life Building, Kansas City 6, Missouri	Lyons	Evaporated and rock

Sand and Gravel

Sand and gravel, the eighth most important mineral commodity produced in Kansas in 1955, was obtained from 71 counties by 120 commercial operators and 46 noncommercial agencies. The total amount of sand and gravel produced in 1955 was 10,664,986 tons valued at $6,909,666, an increase of 2.3 percent in tonnage and a decrease of 4 percent in value when compared to quantity and value in 1954 (Table 33). Of the total sand and gravel produced in 1955, commercial operators produced 9,000,242 tons and noncommercial agencies 1,664,744 tons. As in 1954, Wyandotte and Sedgwick Counties were foremost in the sand and gravel industry in 1955, accounting for 37.2 percent of the total value of all produced. Most of the sand and gravel produced was used for structural and paving purposes, followed by railroad ballast sand, engine sand, molding sand, and filter sand (Tables 34 and 35). Other uses of Kansas sand include glass sand, grinding and polishing sand, and blast sand.

The Builders Sand Company of Kansas City started construction of an open pit sand plant in the Kansas River valley about 3 miles southeast of Bonner Springs, which is in Wyandotte County. The sand will be graded into various types and sold as such. The Owens-Corning Fiberglas Corp. manufacturing insulation equipment at its plant in the Fairfax Industrial District, Kansas City, Kansas, uses Kansas sand. This plant is reported to be the most modern glass-making plant in the industry.

The Shoffner Sand Company of Salina, Saline County, opened a new sand plant about two miles east of Topeka near the Kansas River in Shawnee County.

Sand and gravel producers that operated in 1955 are listed in Table 36.

Sand and gravel reserves are considered inexhaustible, because the demand for sand and gravel is so insignificant when compared to the actual quantity of these deposits that are available. Furthermore, sand especially is continually being replaced by new deposits brought in by streams as the river sand is being used up.

TABLE 33.—*Sand and gravel sold or used by commercial and noncommercial producers in Kansas, 1954 and 1955.*

Year	Commercial Short tons	Commercial Value	Noncommercial Short tons	Noncommercial Value	Total sand and gravel Short tons	Total sand and gravel Value	Av. price per ton	Percent change from 1954 Quantity	Percent change from 1954 Value
1954	8,340,949	6,365,665	2,080,605	828,506	10,421,554	7,194,171	.69		
1955	9,000,242	6,342,242	1,664,744	567,424	10,664,986	6,909,666	.65	+2.3	—4.0

TABLE 34.—*Production of sand in Kansas, 1954 and 1955, by uses*

		Production and value 1954	Production and value 1955
Structural	Tons	3,260,548	3,852,773
	Value	2,205,510	2,701,142
Paving	Tons	2,556,240	2,711,132
	Value	1,648,511	1,715,333
Railroad ballast	Tons	191,612	56,487
	Value	116,379	20,124
Engine	Tons	124,047	46,306
	Value	110,180	43,051
Molding	Tons	102,000	42,030
	Value	51,080	29,030
Filter	Tons	50,404	32,948
	Value	125,004	71,504
Glass	Tons	141,226	*
	Value	308,224	*
Other	Tons	596,116	350,806
	Value	293,139	158,403

*Undistributed, value included with "Other".

TABLE 35.—*Production of gravel in Kansas, 1954 and 1955, by uses*

Use		Production and value	
		1954	1955
Paving	Tons	2,517,421	1,269,706
	Value	1,431,955	988,720
Structural	Tons	726,095	574,285
	Value	759,955	479,748
Railroad ballast	Tons	9,700	.....
	Value	5,596	.....
Other	Tons	146,264	62,969
	Value	138,857	134,384

TABLE 36.—*Directory of sand and gravel producers on record as of December 31, 1955*

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
do	Arkansas Sand & Gravel Co.	1423 Second St. Great Bend
do	Du Bois Sand Co.	P.O. Box 172 Great Bend
do	Gruber Sand Plant	918 Stone St. Great Bend
do	Charles Hardesty	Ellinwood
do	Moos Brothers Sand Co.	Great Bend
do	Savely Sand Co.	Ellinwood St., Ellinwood
Brown	Brown Co. Highway Dept.	Hiawatha
do	Ralph Mitchell	Hiawatha
Butler	Butler Co. Highway Dept.	El Dorado
Chautauqua	Chautauqua Co. Highway Dept.	Sedan
Cheyenne	New Era Sand & Gravel Co.	St. Francis
Clark	Clark Co. Highway Dept.	Ashland
Clay	Gladys H. Alsop	Wakefield
do	Clay Center Concrete-Sand Co.	Clay Center
Cloud	Earl Beaver Sand Co.	Glasco
do	Ross Sand Co.	P.O. Box 461, Concordia
do	Walker Sand Co.	Concordia
Coffey	Coffey Co. Highway Dept.	Burlington
Comanche	Comanche Co. Road Dept.	Coldwater
Cowley	Cowley Co. Highway Dept.	Winfield
do	Arkansas City Sand & Gravel Co.	P.O. Box 166 Arkansas City
do	McFarland Gravel Co.	Arkansas City
do	Geo. M. Meyers, Inc.	El Dorado
do	Oxford Sand & Gravel Co.	Oxford

County	Company or operator	Address
Cowley	Phillips & Son Construction Co.	Winfield
do	Wilson Brothers	Route 3, P.O. Box 59 Arkansas City
do	Winfield Sand & Gravel Co.	Winfield
Dickinson	Shoffner Sand & Gravel Co.	134 E. Jewell, Salina
do	C. Smith Sand & Gravel Co.	1200 N. Kuney, Abilene
Douglas	Bowersock Mills Power Co.	546 Massachusetts St. Lawrence
Edwards	Dave Showalter	Garfield
do	Mekeh Sand & Gravel Co.	Kinsley
Elk	Elk Co. Highway Dept.	Howard
Ellis	Lewis C. Schmidtberger	Victoria
Ellsworth	Ellsworth Co. Highway Dept.	Ellsworth
do	Lowell Johannes	148 S. Clark, Salina
do	Henry Millberger	Wilson
Finney	Finney Co. Highway Dept.	Garden City
do	Sam Alsop Construction Co.	1207 Pinecrest Garden City
do	Smith Sand Co.	Burnside Drive, Box 2 Garden City
Ford	Davis Sand Co.	Dodge City
do	Dodge City Sand Co.	P.O. Box 430 Dodge City
do	Miller Sand & Gravel Co.	Dodge City
Geary	Junction City Sand & Gravel Co.	Route 3, Junction City
do	More Sand Co.	626 W. 6th St. Junction City
Gove	Gove Co. Highway Dept.	Gove
Gray	Kerr Sand Co.	Cimarron
do	Geo. M. Meyers, Inc.	El Dorado
Greenwood	Greenwood Co. Highway Dept.	Eureka
Hamilton	Hamilton Co. Highway Dept.	Syracuse
do	Smith Sand Co.	Burnside Drive, Box 2 Garden City
do	Syracuse Sand & Gravel Co.	107 N. Elizabeth St. Syracuse
Harper	Harper Co. Highway Dept.	Anthony
Harvey	Howard R. Thach	Route 1, Burrton
Haskell	Haskell Co. Highway Dept.	Sublette
do	Howard Mitchell	Hugoton
Jewell	Jewell Co. Highway Dept.	Mankato
Kearny	Kearny Co. Highway Dept.	Lakin
Kingman	Ray Wells	Route 1, Kingman
Kiowa	Kiowa Co. Highway Dept.	Greensburg
do	Seacot Sand Co.	Greensburg
Leavenworth	Missouri Valley Sand Co.	P.O. Box 822 Leavenworth
Linn	Linn Co. Highway Dept.	Mound City

County	Company or operator	Address
Logan	Logan Co. Highway Dept.	Russell Springs
Lyon	Wesley Parks	648 Oak Street, Emporia
do	Harry Waterman	1 Congress St., Emporia
McPherson	A. N. Colburn	Route 1, McPherson
Marion	Virgil Metcalf	Route 5, Council Grove
Marshall	Marshall Co. Highway Dept.	Marysville
do	Blue River Sand & Gravel Co.	Blue Rapids
do	C. V. Garrett	Blue Rapids
do	Kenneth Griffe	Oketo
do	Hall Brothers	204 Calhoun, Marysville
do	Heizelman Construction Co.	Marysville
do	Hugo P. Vogler	Waterville
Miami	Miami Co. Highway Dept.	Paola
Morris	Morris Co. Highway Dept.	Council Grove
do	Virgil Metcalf	Route 5, Council Grove
Ness	Cecil Knoy	Route 1, Ness City
Osborne	Osborne Co. Highway Dept.	Osborne
Ottawa	Ottawa Co. Highway Dept.	Minneapolis
Pawnee	Pawnee Co. Highway Dept.	Larned
do	Willis Eakin, Johnson Sand and Gravel Co.	P.O. Box 545, Larned
do	Larned Sand & Gravel Co.	P.O. Box 227, Larned
Phillips	Phillips Co. Highway Dept.	Phillipsburg
do	Construction Engineer, Kirwin Construction Field Division, Bureau of Reclamation	P.O. Box 317, Kirwin
do	D. G. Hansen	Logan
Pottawatomie	Pottawatomie Co. Highway Dept.	Westmoreland
do	Anderson-Oxandale	Holton
do	Wamego Sand Co.	Wamego
Pratt	Pratt Co. Highway Dept.	Pratt
do	C. D. Hogard	Pratt
do	Miller Sand & Gravel Co.	Route 2, Pratt
Reno	Fountain Sand Pit	Arlington
do	Haven Sand Co.	Haven
do	Henderson Sand and Gravel Co.	Route 2, Hutchinson
do	J. A. Mummy	Nickerson
do	J. H. Shears & Sons	P.O. Box 227 Hutchinson
do	J. E. Steele Sand & Gravel Co.	Route 4, Hutchinson
Republic	Gladys H. Alsop	Wakefield
Rice	Arensman Sand & Gravel Co.	Bushton
do	Rock Hill Stone & Gravel Co.	P.O. Box 412, Sterling
do	A. L. Stapleton	307 S. Garfield, Lyons
do	Sterling Sand & Gravel Co.	P.O. Box 431, Sterling
do	A. Wright & D. Birchenough	Lyons
Riley	Walters Sand Co.	P.O. Box 30, Manhattan

County	Company or operator	Address
Rooks	Construction Engineer, Webster Construction, Bureau of Reclamation	P.O. Box 841, Stockton
Russell	Russell Co. Highway Dept.	Russell
Saline	Putnam Sand Building Co.	P.O. Box 26, Salina
do	Salina Sand Co.	113 W. Minneapolis Salina
Scott	Harry Henery, Inc.	Ottawa
Sedgwick	Sedgwick Co. Highway Dept.	1015 Stillwell Ave. Wichita 12
do	City Engineer	Wichita 2
do	John Beagley	Mount Hope
do	Bentley Sand Co.	Bentley
do	Big Three Sand & Gravel Co.	2204 N. West Wichita 15
do	John E. Blair	4155 N. Arkansas Wichita 4
do	Bob Sand & Gravel Co.	21st St. & Meridian Wichita
do	Dolese Brothers Co.	13 N.W. 13th St. Oklahoma City, Okla.
do	L. C. House	Route 2, Bentley
do	Inland Construction Co.	P.O. Box 1993, Wichita
do	Walter Keeler Co.	P.O. Box 1972 Wichita 1
do	McKinster-Gore Sand Co.	Route 6, Box 408 Wichita
do	Miles Sand Service	Valley Center
do	Southwest Sand & Gravel Co.	Route 8, Wichita 15
do	Superior Sand Co.	1800 W. 18th, Wichita 3
do	Vics Sand & Gravel Co.	1806 Garland, Wichita
do	Wichita Big River Sand Co.	623 W. 27th, Wichita
do	L. R. York	P.O. Box 61, Sedgwick
Shawnee	State Highway Commission, Engineer of Maintenance	Topeka
do	Shawnee Co. Engineers Office	Topeka
do	City Engineer, Topeka	Topeka
do	Kansas Sand Co.	531 N. Taylor, Topeka
do	River Sand Co.	P.O. Box 233, Topeka
do	Schoffner Sand Co.	Solomon
do	Victory Sand & Stone Co.	Foot of Waite, Topeka
Sheridan	Sheridan Co. Highway Dept.	Hoxie
do	Harry Henery, Inc.	Ottawa
do	Carl Kaiser	Grainfield
Sherman	Sherman Co. Highway Dept.	P.O. Box 22, Goodland
do	J. R. Hahn	Goodland
do	Tom Ramsey	802 Center, Goodland
do	Forrest Seigal	216 Main, Goodland
Smith	Smith Co. Highway Dept.	Smith Center

County	Company or operator	Address
Stafford	County Engineer, Stafford County	St. John
do	Partin Sand & Gravel Co.	P.O. Box 274, Stafford
Stanton	Harry Henery, Inc.	Ottawa
Sumner	Sumner Co. Highway Dept.	Wellington
do	Mulvane Sand Co.	Mulvane
Thomas	Thomas Co. Highway Dept.	Colby
do	Earl Carpenter	Colby
do	Hawki-Carpenter	Colby
do	Ed Purma	975 2nd Street Colby
Trego	Trego Co. Highway Dept.	WaKeeney
do	Siebert Sand Co.	Trego Center
Wallace	Wallace Co. Highway Dept.	Sharon Springs
do	Lacey Gravel Co.	Sharon Springs
Washington	Washington Co. Highway Dept.	Washington
do	Finlayson Gravel Co.	Barnes
do	Mueller Sand & Gravel Co.	Hanover
Wyandotte	American Sand Co.	Turner
do	Builders Sand Co.	Morris
do	Dreyer Sand Co.	Turner
do	Happe Sand Co.	Muncie
do	Holiday Sand & Gravel Co.	728 Railway Exchange Bldg., Kansas City 6, Mo.
do	Kaw Valley Sand Co.	42nd & Speaker Road Kansas City
do	Ebb Rees	1228 Homer St. Kansas City
do	Stewart Sand Material Co.	1805 Grand Ave. Kansas City 8, Mo.
do	Peck Woolf Sand & Material Co.	1920 Paseo Blvd. Kansas City 8, Mo.
Various	Atchison, Topeka, and Santa Fe Railway	Chicago 4, Illinois
do	J. Alsop & E. Fyfe	Wakefield
do	San Ore Construction Co.	McPherson
	Sand, Incorporated	1313 West 31, South, Wichita 2

Stone

Stone, fourth in importance among the minerals produced in Kansas in 1955, amounted to 12,470,116 tons valued at $15,887,269, an increase of 20 and 23 percent respectively when compared to the 1954 production and value (Table 37). Stone produced in Kansas consists of limestone, sandstone, and chat; the last is

TABLE 37.—*Production and value of stone produced in Kansas, 1954 and 1955, by kinds*

Year	Limestone Tons	Limestone Value	Sandstone Tons	Sandstone Value	Miscellaneous Tons	Miscellaneous Value	Total stone Tons	Total stone Value	Percent change from 1954	
1954[a]	9,151,167	11,924,543	355,430[b]	687,180	860,493	297,864	10,367,090	12,090,587		
1955	10,847,530	14,362,675	745,349[b]	1,221,726	877,237	362,668	12,470,116	15,887,269	+20	+23

[a]Revised figures.
[b]Excludes dimension sandstone, value for which is included under "undistributed".

TABLE 38.—*Summary of stone production in Kansas, 1954 and 1955, by uses*

		1954	1955
Concrete, road metal	Tons	5,661,627	7,391,915
	Value	7,595,952	9,851,626
Railroad ballast	Tons	1,017,909	797,944
	Value	540,271	439,333
Riprap	Tons	511,925	703,567
	Value	686,368	969,192
Agricultural	Tons	518,415	426,090
	Value	764,325	611,407
Dimension stone	Tons	39,022	40,375
	Value	764,427	731,665
Other or miscellaneous	Tons	189,915	3,110,225
	Value	402,502	3,284,046
Total	Tons	7,096,057	12,470,116
	Value	10,597,540	15,887,269

associated with the metal mining industry of the Tri-State Lead and Zinc District in southern Cherokee County. Chat in the tables is included under "miscellaneous" stone.

Most of the stone produced in Kansas was used for concrete and road metal. In 1955 stone crushed and used for concrete and road metal amounted to 7,391,915 tons valued at $9,851,626, of which 6,907,857 tons and $9,285,330 were derived from limestone. Quantitatively, next in importance was stone used as railroad ballast, followed by riprap material, agricultural lime, and dimension stone. On the basis of value, concrete and road metal was first with a value of $9,851,626, then riprap valued at $969,192, followed by dimension stone worth $731,665, agricultural lime with a value of $611,407, and railroad ballast valued at $439,333. Agricultural lime, dimension stone, and railroad ballast production declined in quantity and value in 1955. A summary of Kansas stone production and values by kinds for 1954 and 1955 is presented in Table 38. Table 39 shows Kansas stone production and values by kinds of rock and uses for 1954 and 1955.

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

TABLE 39.—*Kansas stone production and values by kinds of rock and uses, 1954 and 1955*

	1954		1955	
	Tons	Value	Tons	Value
Limestone crushed-concrete roadmetal	5,474,890	7,283,276	6,907,857	9,285,330
Railroad ballast	186,129	249,657	73,323	96,529
Riprap	330,300	379,668	289,660	293,898
Agricultural	518,415	764,325	426,090	611,407
Dimension stone	38,626	763,355	40,375	731,665
Other or miscellaneous	148,401	310,006	3,110,225	3,284,046
Sandstone crushed-concrete, roadmetal	120,753	246,578	269,133	458,252
Railroad ballast	7,767	11,650	68,309	93,280
Riprap	181,625	306,700	407,907	670,194
Dimension stone		*		*
Other	4,514	92,496		
Miscellaneous crushed-concrete, roadmetal	75,984	66,098	214,925	108,524
Railroad ballast	824,013	278,964	656,312	249,524
Riprap			6,000	5,100
Dimension stone	396	1,072		
Other	36,480	18,900		

*Value included under "undistributed" Table 1.

In 1955 stone in Kansas was produced by 70 commercial companies operating in 41 counties and by 35 noncommercial operators, principally county highway departments. A new stone quarry and crushed stone company was started 5 miles north of Lawrence, Douglas County, early in the spring of 1955. The Jayhawk Crushed Stone Corporation, owner and operator of the new plant, will produce all grades of crushed stone for state and federal specifications and will also produce agricultural lime. Crushing capacity at the plant will be around 300 tons of rock per hour. Greatest activity in the stone industry centered in Wyandotte and Elk Counties, which accounted for 23.1 percent of the state's limestone and 20.8 percent of all stone produced.

A directory of stone producers in Kansas operating in 1955 is given in Table 40.

TABLE 40.—*Directory of stone producers on record as of December 31, 1955*

County	Company or operator	Address
Allen	Allen Co. Highway Dept.	Iola
do	Lehigh Portland Cement Co.	Iola
do	Monarch Cement Co.	Humboldt
do	Nelson Brothers Quarries	La Harpe
Anderson	Anderson Co. Highway Dept.	Garnett
do	Garnett Rock Co.	Garnett
Atchison	Ralph Bromley	Atchison
do	George W. Kerford Quarry Co.	Atchison
Bourbon	Bourbon Co. Highway Dept.	Fort Scott
do	Bandera Stone Quarry*	222 W. 72nd St. Kansas City, Mo.
do	Cullor Limestone Co.	Route 1, Fort Scott
do	Fort Scott Hydraulic Cement Co.	P.O. Box 267, Fort Scott
Butler	County Engineer, Butler County	El Dorado
do	City of El Dorado	El Dorado
do	Ariis Construction Co.	P.O. Box 1871, Oklahoma City, Okla.
do	Concrete Materials Construction Co.	Moline
do	George M. Meyers	P.O. Box 669, El Dorado
Chautauqua	Sedan Limestone Co.	Sedan
Cherokee	Baxter Chat Co.†	Baxter Springs
do	Eagle-Picher Mining & Smelting Co.	Miami, Okla.
do	Frances Reeves Limestone Co.	P.O. Box 36, Columbus
do	C. Y. Semple	Baxter Springs
Clay	Clay Co. Highway Dept.	Clay Center
do	Anderson-Oxandale	P.O. Box 425, Herington
Coffey	Neosho Valley Rock Co.	Burlington

County	Company or operator	Address
Cowley	Anderson-Oxandale	P.O. Box 425, Herington
do	C. L. Daniels Stone Co.	Winfield
do	John V. Elam	Winfield
do	Silverdale Cut Stone Co.	Silverdale
do	Silverdale Limestone Co.	Route 3, Box 180 Arkansas City
Crawford	John J. Stark	P.O. Box 7, Girard
Dickinson	Anderson-Oxandale	P.O. Box 425, Herington
do	Riddle Quarries, Inc.	National Bank of America Bldg., Salina
Doniphan	District Engineer, Corps of Engineers	1800 Fed. Office Bldg., 911 Walnut Street Kansas City 6, Mo.
do	Everett Quarries	Plattsburg, Mo.
do	George W. Kerford Quarry Co.	Atchison
do	Wolf River Limestone Quarry	Trov
Douglas	Douglas Co. Highway Dept.	Lawrence
do	Palmyra Township Highway Dept.	Baldwin
do	Clark Rock Quarry	Overbrook
do	Killough Construction Co.	1414 Cedar St., Ottawa
Elk	Elk Co. Highway Dept.	Howard
do	Concrete Materials Construction Co.	Moline
Ellis	Ellis Co. Highway Dept.	Hays
Franklin	Franklin Co. Highway Dept.	Ottawa
do	Dan Fogle	Ottawa
do	Killough Construction Co.	1414 Cedar St., Ottawa
do	Bert Ross	634 S. Oak St., Ottawa
Geary	W. O. Homer Construction Co.	Grand Ave., Junction City
do	Walker Cut Stone Co.	P.O. Box 269, Junction City
Graham	Graham Co. Highway Dept.	Hill City
do	U.S. Bur. Reclamation, Construction Engineer	Stockton
Greenwood	Greenwood Co. Highway Dept.	Eureka
Jackson	G. W. Baker	Holton
do	Reno Construction Co.	Overland Park
Jefferson	Roy Baker	Valley Falls
do	N. R. Hamm Quarry	Perry
Jewell	Ideal Cement Co.	Superior, Nebr.
Johnson	Johnson Co. Highway Dept.	Olathe
do	Deitz Hill Development Co.	28 Southwest Blvd., Kansas City 10, Mo.
do	Reno Construction Co.	Overland Park
Labette	Labette Co. Highway Dept.	Oswego
do	City of Parsons, Street Dept., City Engineer	Parsons

County	Company or operator	Address
Labette	Anderson-Oxandale	P.O. Box 425, Herington
do	John J. Stark	P.O. Box 7, Girard
Leavenworth	City of Leavenworth, Street Dept.	Leavenworth
do	Kansas State Penitentiary	Lansing
do	J. C. Haigwood	Tonganoxie
do	Loring Quarries	P.O. Box 174, Bonner Springs
Lincoln	Quartzite Stone Co.	Lincoln
Linn	Lee Giles	Greeley
do	Murray Limestone Production Co.	Centerville
Lyon	Lyon Co. Highway Dept.	Emporia
do	City of Emporia Highway Dept.	Emporia
do	Anderson-Oxandale	P.O. Box 425, Herington
Marion	Riddle Quarries	National Bank of America Bldg., Salina
Marshall	Marshall Co. Highway Dept.	Marysville
Miami	Miami Co. Highway Dept.	Paola
do	L. W. Hayes, Hayes Quarries	4550 Main St., Kansas City 2, Mo.
Montgomery	Montgomery Co. Highway Dept.	Independence
do	City of Caney Highway Dept.	Caney
do	City of Coffeyville, City Engineer	Coffeyville
do	Anderson-Oxandale	P.O. Box 425, Herington
do	Universal Atlas Cement Co.	100 Park Ave. New York 17, N.Y.
Morris	Anderson-Oxandale	P.O. Box 425, Herington
Nemaha	County Engineer, Nemaha Co.	Seneca
Neosho	County Engineer, Neosho Co.	Erie
do	Ash Grove Lime & Portland Cement Co.	101 W. 11th St. Kansas City, Mo.
do	Harry Byers	500 N. Plummer, Chanute
do	Joe O'Brian	St. Paul
Osage	K. S. Dusenbury	P.O. Box 224, Melvern
do	Perry Jones	Carbondale
Phillips	Construction Engineer, Kirwin Construction, Field Division, Bureau of Reclamation	P.O. Box 317, Kirwin
do	E. C. Sestrocter Construction Co.	McGregor, Iowa
do	Texas Construction Co.	202 Davis Bldg., Dallas, Texas
Pottawatomie	Pottawatomie Co. Highway Dept.	Westmoreland
do	Manhattan Cut Stone	P.O. Box 855,Manhattan
Rice	Riddle Quarries	National Bank of America Bldg., Salina
Riley	Manhattan Stone Co.	414 S. 5th St., Manhattan
do	Riddle Quarries	National Bank of America Bldg., Salina

County	Company or operator	Address
Sedgwick	City of Wichita Highway Dept.	City Building, Wichita 2
Shawnee	Henry C. Luttjohaun	2001 James St., Topeka
do	Netherland Construction Co.	1315 MacVicar, Topeka
do	Pattons Crushed Stone Co.	Pauline
Wabaunsee	G. W. Baker	Holton
Washington	County Engineer, Washington Co.	Washington
Wilson	Wilson Co. Highway Dept., County Engineer	Fredonia
do	Benedict Rock-Lime Co.	Benedict
do	Carr Rock Products Co.	P.O. Box 117, Neodesha
do	Consolidated Cement Corp.	Fredonia
Wyandotte	County Engineer, Wyandotte Co.	Kansas City, Kans.
do	American Rock Crusher Co.	3700 Rainbow Blvd. Rosedale, Kansas City, Kans.
do	Joe Gregor	836 Bunker St. Kansas City, Kans.
do	Lone Star Cement Corp.	1651 Dierks Bldg. Kansas City 6, Mo.
do	Peerless Quarries	Turner
do	Thompson-Strauss Quarries, Inc.	7000 Holiday Drive Kansas City, Kans.

METALS

The only metals mined in Kansas are lead and zinc. All the mines are in Cherokee County in the southeast corner of the state. The Kansas lead and zinc area is part of the Tri-State District, which comprises parts of Missouri, Oklahoma, and Kansas. The Tri-State District produces more zinc than any other area in the United States and ranks third in the production of lead. In 1955 Kansas produced lead and zinc worth $8,432,909. The metals contributed 1.8 percent of the value of all minerals produced in the state (Table 4, Fig. 3). In 1955 Kansas produced 5,498 tons of recoverable lead and 27,611 tons of recoverable zinc.

Lead

Lead production in 1955 exceeded production in 1954 by 1,465 short tones and in value by $535,561, an increase in quantity of 36.3 percent and in value 48.4 percent. Recoverable lead in 1955

amounted to 5,498 tons valued at $1,640,603, and 4,033 tons worth $1,105,042 in 1954. On record as having produced lead in 1955 are 36 mines operated by 23 companies and 8 gougers.

The Eagle-Picher Company was the principal lead producer, followed by the National Lead Company. The only lead smelter operated in Kansas was the Eagle-Picher 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 1955.

Data on lead production in Kansas in 1954 and 1955 and directory of lead and zinc producers on record as of December 31, 1955, are presented in Tables 41 and 42 respectively.

TABLE 41.—*Quantity and value of lead produced in Kansas, 1954 and 1955*

Year	Concentrates (galena)		Recoverable metal (Lead)		Percent change from previous year	
	Tons	Value	Tons	Value	Amount	Value
1954	5,390	916,161	4,033	1,105,042		
1955	7,362	1,352,876	5,498	1,640,603	36.3	48.4

ZINC

Zinc, eighth in rank among Kansas minerals produced, increased from 19,110 tons valued at $4,127,760 in 1954 to 27,611 tons worth $6,792,306 in 1955, an increase of 44.5 and 64.6 percent respectively. During 1955, 23 companies and 8 gougers produced zinc from 36 mines.

The Eagle-Picher Company was the largest zinc producer in the state, followed by the National Lead Company. A zinc pigment plant was active in Cherryvale, Montgomery County, in 1955. This plant was operated by the National Zinc Company.

Data on zinc production in Kansas in 1954 and 1955 and directory of zinc producers on record as of December 31, 1955, are presented in Tables 43 and 42 respectively.

TABLE 42.—*Directory of lead and zinc producers in Kansas on record as of December 31, 1955*

Operator or Company	Address	Mine*
American Zinc, Lead & Smelting Co.	Joplin, Mo.	Karcher-Stebbins
B & I Mining Co.	Baxter Springs	F. Hartley
Kenneth Bagin	do	Thomas
Carey-McCoy Mining Co.	Treece	Hartley-Grantham
Harley Drane	do	Naylor-Boulders
Do-More Mining Co.	Picher, Okla.	Stoskopt
G. W. Duncan	c/o C. G. Marquiss 5th & Military Baxter Springs	Race Track
Eagle-Picher	Miami, Okla.	Big John, Grace B, K. E. Jarrett, Lucky, Jew, Muncie, Weber, Westside-Hartley
John Henderson	Commerce, Okla.	Wilbur
J. E. McDonald	Treece	Boulders
Mark Twain Mining Co.	Picher, Okla.	Jarrett
Mid-Century Mining Co.	do	Bendelari
Mid-Continent Lead & Zinc Co.	do	Mid-Continent
National Lead Co., Smelting & Refining Division	Fredericktown, Mo.	Ballard, Hartley, Moore, Shanks, Slaughter, Smith, Swalley
Frank Poole	Picher, Okla.	Lindsey Land
S. S. & C. Mining Co.	do	Stoskopt
Searcy-Henderson	do	Stoskopt
Harold Sheeran	do	Cherokee, Chubb
J. G. Shelton	Miami, Okla.	Hunter
Tiger Mining Co.	Picher, Okla.	Silver Fox
E. D. Vicory	do	Northern
8 Miscellaneous Gougers		Various

*All lead and zinc mines in Kansas are situated in Cherokee County.

TABLE 43.—*Quantity and value of zinc produced in Kansas, 1954 and 1955*

Year	Concentrates (sphalerite) Tons	Concentrates (sphalerite) Value	Recoverable metal (zinc) Tons	Recoverable metal (zinc) Value	Percent change from previous year Amount	Percent change from previous year Value
1954	38,896[a]	2,638,102	19,110[b]	4,127,760		
1955	51,252	3,980,849	27,611	6,792,306	+44.5	+64.6

[a]Includes 360 tons from old tailings remitted.
[b]Includes 194 tons from old tailings remitted.

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 by fewer than three companies or because they are produced almost exclusively by one company. Such minerals include diatomaceous marl, gypsum, natural cement, and in some years certain stone commodities. In addition, perlite and expanded vermiculite were processed within recent years from material shipped into Kansas from outside sources.

Cement (Natural)

Natural cement was produced solely by the Fort Scott Hydraulic Cement Co. of Fort Scott in Bourbon County. Unlike former years when shipments of natural cement fluctuated but slightly from year to year, shipments in 1955 exceeded shipments of 1954 by over 90 percent. Values at the same time increased as much as 158 percent. The value of the 1955 natural cement shipments is included in the value listed under "undistributed", Table 1.

Diatomaceous Marl

Production and value of diatomaceous marl produced in Wallace County in 1955 by the DeLore Division of the National Lead Company of St. Louis, Missouri, increased approximately 18 percent when compared to production and value of 1954. Value of the diatomaceous marl is included in the total listed under "undistributed" in Table 1.

The known deposits of diatomaceous marl are estimated to exceed 1 million tons.

Gypsum

Gypsum in Kansas was produced by the National Gypsum Co. of Buffalo, New York, near Medicine Lodge, Barber County, and by the Certain-teed Products Corp. of Ardmore, Pennsylvania, at Blue Rapids, Marshall County. Gypsum production, both crude and calcined, increased in 1955 from that reported in 1954. Increases in tonnage in crude and calcined gypsum amounted to over 16 and 20 percent respectively, and in value

from 57 to 41 percent in 1955 over 1954. The value of the crude gypsum produced is included under the value assigned to the "undistributed" minerals (Table 1).

The National Gypsum Company, Medicine Lodge, Barber County, installed an 18-ton calcinating kettle to refine raw gypsum into finished plaster.

The reserves of gypsum have never been estimated quantitatively. The gypsum deposits in the state are very extensive, and at the present rate of production and use the reserves are sufficient for production to be maintained for many years to come.

Perlite and Expanded Vermiculite

Expanded perlite and expanded vermiculite were processed in Kansas from raw materials imported from other states. Both industries showed losses in value of products made when compared to those or the preceding year. Expanded perlite was processed by the Panacalite Perlite, Inc., of Kansas City, Wyandotte County, and expanded vermiculite by the Dodson Manufacturing Company of Wichita, Sedgwick County. Values of perlite and expanded vermiculite are included in the total listed under "undistributed" in Table 1.

Dimension Sandstone

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 1955 was essentially the same as in 1954. 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 uni-

versal 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 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 dollars 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 commerial 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 waters (Schoewe, 1953, p. 133), oil shale (Runnels and others, 1952), phosphatic 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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