STATE GEOLOGICAL SURVEY OF KANSAS, BULLETIN 64
1946 REPORTS OF STUDIES, PART 4, PAGES 125-144, PLATES 1-3, FIGURE 1
NOVEMBER, 1946

STRIP-MINED AREAS IN THE SOUTHEASTERN KANSAS COAL FIELD

By G. E. ABERNATHY

PLATE 2. Aerial photo of coal washing plant, coal strip pits, and railroad yards, Cherokee County, Kansas.

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ILLUSTRATIONS

ABSTRACT

This report, prepared in response to inquiries concerning strip coal mine operations in southeastern Kansas, gives a register of companies operating strip mines, a description of operating methods, and shows by a large map the location of active shovels and the area and name of each coal stripped. Analyses and production data are also given.

INTRODUCTION

This report has been prepared in response to a large number of inquiries concerning the location of stripped areas of the coal beds in southeastern Kansas. The purpose of the report is to give a register of the coal mining companies operating strip mines in southeastern Kansas, to give a description of operating methods, and to show the location of active shovels, the name of the coal bed being mined at each location, and the areas of each coal bed that have been stripped.

The field work for this report was done during parts of several field seasons. Most of the strip pits have been mapped by field work; however, some information was supplied by coal companies.

Acknowledgments.—This opportunity is taken to thank officials of coal mining companies that have operated or are operating in this field, particularly those of the Pittsburg and Midway Coal Mining Company, who supplied chemical analyses of coals; the Mackie-Clemens Coal Company; and the Klaner Coal Company. Production data were obtained from unpublished reports in the State Mine Inspector's office.

GEOGRAPHY

The location of the stripped area of coal beds in southeastern Kansas is shown in Plate 1. It is an irregular-shaped elongated area extending from southwest of Chetopa in Labette County in a northeasterly direction to east of Pleasanton in Linn County on the Kansas-Missouri state line.

The stripped areas of coal beds in southeastern Kansas comprise broad relatively level erosional plains that truncate the out-cropping edges of the soft easily eroded beds of shale, sandy shale, and coal of the Cherokee and Bandera shales. The surface of the ground slopes to the west at an average rate of about 10 feet to the mile in the stripped areas.

HISTORY OF MINING

Available records indicate that coal was first stripped commercially near Fort Scott in 1865 (Crane, 1898, p. 178). In 1866, coal was obtained from the outcrop of the Weir-Pittsburg bed in Cherokee County and hauled by wagon to Granby, Missouri, where it was used as blacksmith coal.

The earliest operations were in strip mines or wagon-pit mines along the banks of creeks. The thin overburden was removed by horses and scrapers, and the coal was loaded by hand into wagons.

The first railroad built in the Southeastern Kansas coal field was completed to Baxter Springs in 1870. Railroad contractors soon became interested in the problem of removing the overburden by mechanical means. The first recorded use of a steam shovel in strip coal mining in the United States was near Pittsburg in 1877 by the Hoges-Armil Coal Company, which began using a steam shovel to remove the overburden from the Weir-Pittsburg coal bed. The first revolving shovel in this area was used in 1905; it had a 2-yard dipper and was designed to remove a maximum of 15 feet of overburden. Larger shovels with 3-yard dippers were used in 1911. Shovels having booms 75 feet long and dippers of 6 cubic yards capacity were in common use in 1915. There has been a gradual increase in the size of shovels between 1920 and the present time. The largest shovel now in operation has a boom 95 feet long, a dipper capacity of 30 cubic yards, and is capable of stripping 64 feet of overburden.

The present practice consists of preliminary stripping of about 15 feet of overburden with a drag-line shovel, and the remaining overburden is removed with an electric shovel. The large drag-line shovels have booms about 200 feet long and buckets with a capacity of about 10 cubic yards.

MINING METHODS

Open-pit or strip mining is used where the overburden is not too thick, usually at or near outcrops of the coal beds. Strip mining methods are well adapted to the Southeastern Kansas coal field, where a combination of low-dipping coal beds and low topographic relief results in large areas where the overburden is 60 feet or less in thickness.

Blasting overburden.—Where the overburden consists of soft shales, the shovels are able to remove it without blasting; when hard shales or sandstones are encountered they must be blasted. The common practice is to drill a 4-inch hole with a churn drill through the overburden or to the coal bed, "spring" the hole with dynamite, then blast with black powder. In addition to this type of blasting, some holes are drilled horizontally with a rotary drill a few feet above the top of the coal bed, about equal in depth to the width of the pit, then blasted with dynamite and black powder. Blasting the overburden breaks and shatters the layers of hard rock in it.

Stripping shovels.—When uncovering coal the stripping shovel works alternately back and forth across the property and deposits the overburden removed from the coal in more or less parallel ridges. Each strip of coal uncovered has an average width of about 60 feet.

Most of the coal strip mining in Kansas has been in Crawford and Cherokee Counties, where about 20,000 acres have been stripped.

All large shovels in the Southeastern Kansas coal field are electric, whereas most of the small shovels are steam (Pl. 3B).

The large electric shovels have booms 95 feet long and dippers with 30 cubic yard capacities, weigh about 1,750 tons, and require about 45 railroad cars for the shipment of the unassembled shovel. The average amount of electricity used by a large electric shovel is about 205,000 kilowatt hours per month. With normal working conditions and with an overburden of about 40 feet, the length of the strip of coal uncovered by the shovel or the distance the shovel travels will average about 57,000 feet in one year of operation. Large electric shovels have been known to handle more than 1 million cubic yards of overburden in one month of operation. The performance of an electric shovel with a 6-cubic yard dipper and a 75-foot boom was reported by Young in 1925 to have excavated 44,290 cubic yards in one month.

The ratio of overburden removed, in feet, to the thickness of the coal, in feet, has been considered to be about 20 to 1; however, with recent improvements in equipment and methods of operation, the present maximum practical ratio of overburden stripped to workable coal is about 35 cubic yards to one ton of coal.

Loading shovels.—After the overburden has been removed the coal is loosened before loading by drilling holes with electric hand drills and shooting with a small charge of dynamite.

In the earlier days of strip mining, all loading was done by hand. This practice of loading was followed by the use of small steam shovels; however, this type of shovel produced a large amount of fine coal.

Later a specially designed coal loader was developed in this coal field and is now in common use. It is operated by steam or electricity and has a horizontal boom, the dipper being forced out horizontally, passing along the bottom of the coal bed with very little breaking of the coal.

In some mines the loading shovel loads the coal into boxes that are hoisted out of the pit by a "bank machine" which hoists the boxes of coal to narrow-gauge cars or dumps them into standard gauge railroad cars on the surface. In other mines the loading shovel loads the coal into large 40-ton capacity diesel-powered trucks that haul the coal out of the pits and directly to the tipple.

Coal preparation.—In the earlier days of mining, coal was sold as it came from the mine as mine-run coal. Later the coal was screened and sized at the tipple (Pl. 3A).

Although some coal that has been only screened at the tipple is now marketed, the common practice is to size and clean the coal in a modern washing plant (Pl. 2). A few years ago only four sizes of coal were prepared for market: slack, pea, nut, and lump. However, at the present time 23 different grades of coal as shown in Table 1, are prepared for the market.

TABLE 1.—*Range of coal sizes marketed from the Southeastern Kansas coal field.*

Size, inches	Trade name	Size, inches	Trade name
7-	fancy lump	2x1¼	no. 2 nut
7x3	furnace	2x¾	no. 3 nut
6x3	furnace	2x¾	railroad nut
6x2	furnace or modified	2x0	nut run
6x1¼	modified	1¼x¾	chestnut
6x¾	modified	1¼x5/16	chestnut
6x3	crushed modified or coarse mine run	1¼x0	mill
		1x¼	H. H. Stoker
6x0	mine run	¾x5/16	H. H. Stoker
3x2	fancy nut	¾x0	slack
3x1¼	domestic or no. 1 nut	¼x¼	slack
3x¾	railroad nut		
3x0	nut run		

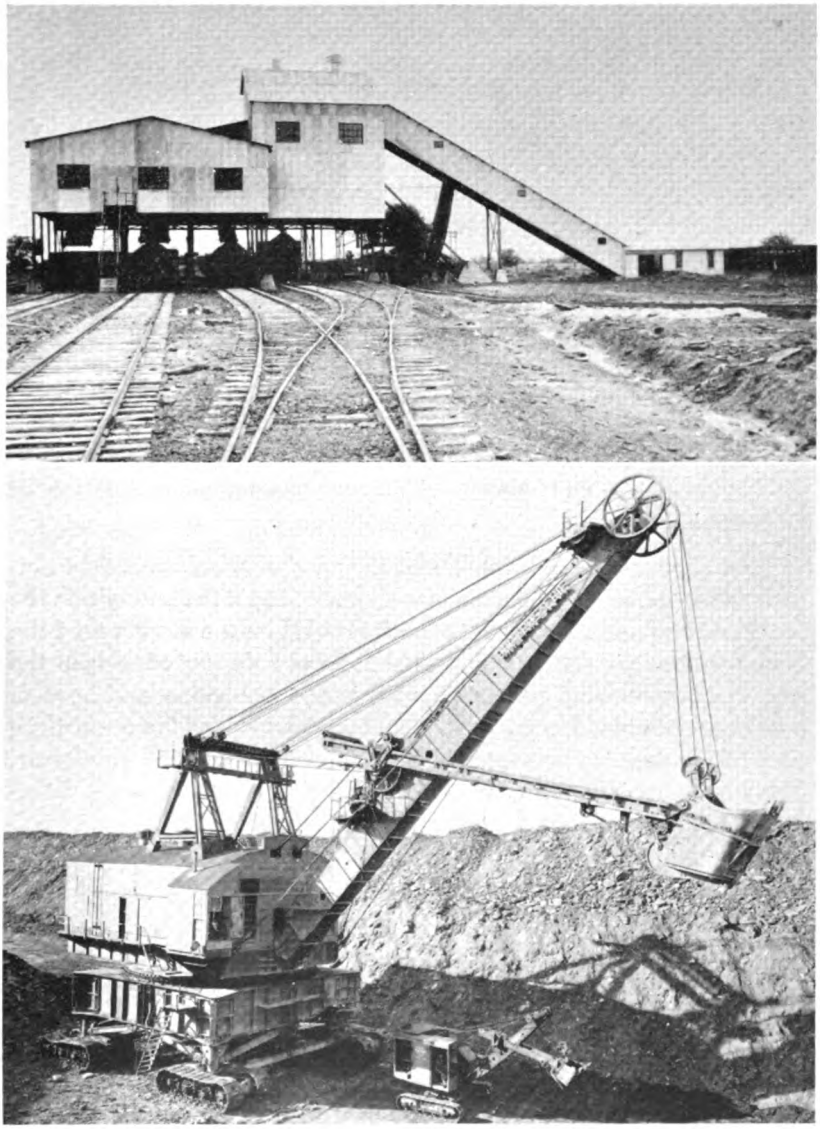

PLATE 3. Above, coal tipple used in screening and loading coal in southeastern Kansas; below, large shovel used for stripping overburden and a small one used for loading coal in the strip pits.

STRATIGRAPHY

The oldest group of rocks containing economically important coal beds in southeastern Kansas is the Cherokee shale, which crops out in Cherokee and Crawford Counties. The youngest group of rocks containing coal beds that have been mined in eastern Kansas coal fields by strip mining operations is the Wabaunsee group in Osage County. A generalized section of the Pennsylvanian rocks in Kansas showing the position of the principal coal beds is shown in Figure 1.

Cherokee shale.—The Cherokee shale includes all outcropping Pennsylvanian rocks below the Fort Scott limestone in Kansas, which consists of light- and dark-colored shales, sandstones, sandy shales, a few thin beds of limestone, and the most important coal beds of the state. The Cherokee shale is not readily divisible into formations unless cyclic units (cyclothems) are so defined. The Cherokee shale and the overlying Marmaton group are of Desmoinesian age.

The character of the rocks and the kind of fossils contained indicate that the Cherokee shale was deposited in a basin in which the sea advanced and retreated many times. When the sea covered the basin, limestone, sandstone, and shale were deposited; while the sea was absent from the basin, nonmarine sandstone and beds of coal accumulated. Each advance and withdrawal of the sea is indicated by a definite sequence of beds in a cyclic unit (cyclothem). The members of this sequence, beginning at the bottom, are sandstone, underclay, coal, black shale, gray shale, limestone, and calcareous shale. The Cherokee shale has an average thickness at the outcrop of about 450 feet.

Fort Scott limestone.—The Fort Scott limestone directly overlies the Cherokee shale and is the lowest formation in the Marmaton group. It consists of two limestone members separated by 5 or 6 feet of shale, which is mostly black and which locally contains a thin limestone and a bed of coal known as the Summit coal. Its average total thickness is about 33 feet.

The lower limestone, the Blackjack Creek member, ranges in thickness from 4 to 17 feet. It is brownish gray to light gray, crystalline, and massive to thin bedded.

The upper limestone, the Higginsville member, is light-gray and thin-bedded to massive limestone characterized by the scat-

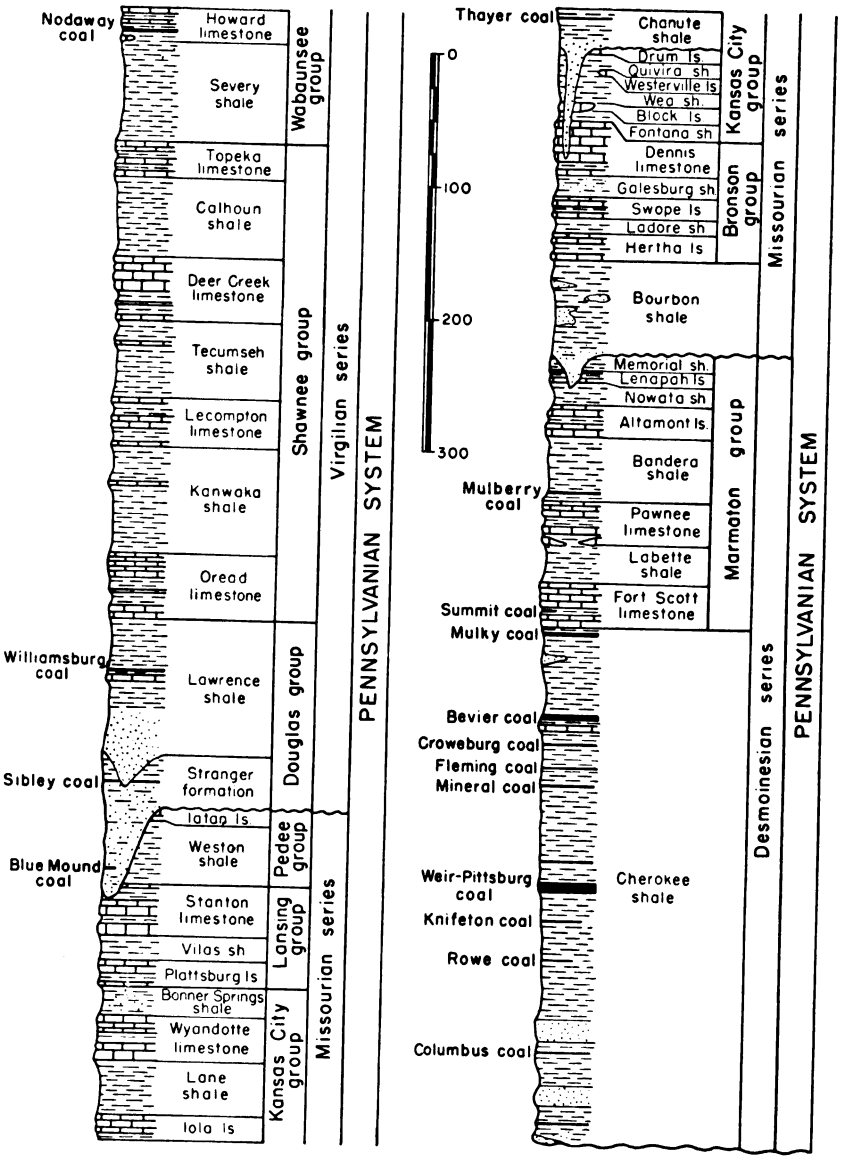

FIGURE 1. Generalized section of Pennsylvanian rocks in Kansas showing the position of principal coal beds.

tered occurrence of unusually large crinoid stems, fusulines, and colonies of *Chaetetes.* (Moore, Frye, and Jewett, 1944, p. 197).

The intervening shale member, the Little Osage, is a black platy shale that has an average thickness of about 8 feet. This shale member contains the Summit coal and the Houx limestone beds.

Labette shale.—The Labette shale lies between the Fort Scott and Pawnee limestone formations. It consists of shale, sandy shale, and sandstone. Its thickness ranges from about 20 to 50 feet. For the most part, the width of the outcrop is less than 1 mile, but at several localities the shale crops out over areas of several square miles. The shale is much softer than the limestones above and below it and consequently occupies the gentle slopes and valleys between the escarpments of the Fort Scott and Pawnee limestones.

Pawnee limestone.—The Pawnee limestone consists of two persistent limestone members separated by a shale member. Its average total thickness is about 30 feet. Black platy shale below the lower limestone is regarded as a part of the formation (Moore, Frye, and Jewett, 1944, p. 196).

Bandera shale.—The Bandera shale lies above the Pawnee limestone and below the Altamont limestone. It has an average thickness of about 45 feet. The Mulberry coal bed is a persistent bed in the lower part of the Bandera north of Crawford County. This formation, like the Labette shale, contains much sandstone and sandy shale. The Bandera shale occurs in about the middle of the Marmaton group.

The Altamont limestone, Nowata shale, Lenapah limestone, and Memorial shale comprise the upper part of the Marmaton group. In Kansas these formations do not contain important coal beds (Fig. 1).

Missourian series.—The Missourian series overlies the Marmaton group. The outcrop area of this series in southeastern Kansas is a belt ranging in width from 20 to 40 miles and extending northeast from Montgomery County through Wilson County.

The Chanute shale is the only formation in the series that contains a coal bed of economic importance. The Thayer coal bed, a member of the Chanute, crops out in eastern Wilson and western Neosho Counties.

Virgilian series.—The Virgilian series overlies the Missourian series and consists of the Douglas, Shawnee, and Wabaunsee

groups. The only formation in the Virgilian series which contains a coal bed that has been mined by stripping methods is the Howard limestone of the Wabaunsee group. The Nodaway coal occurs in the Howard limestone and crops out in Osage County.

COAL BEDS OF THE SOUTHEASTERN KANSAS COAL FIELD

The economically important coal beds in the Southeastern Kansas coal field are, in ascending order: Columbus, Rowe, Weir-Pittsburg, Mineral, Fleming, Croweburg, Bevier, Mulky, Summit, and Mulberry.

Columbus coal bed.—The Columbus coal bed occurs about 175 feet above the base of the Cherokee shale. Its average thickness in pits that have been worked is about 12 inches. It has been mined by small slope mines and by steam shovels in the vicinity of Columbus in Cherokee County. The coal has a heating value of 12,350 B.t.u. and an ash content of about 16.9 percent.

Rowe coal bed.—The Rowe coal bed has not been mined extensively but has been worked in a few shallow pits in Cherokee and Crawford Counties south and southeast of Pittsburg. Where it has been worked its thickness ranges from 14 to 18 inches, but it contains a shale parting 2 inches thick about 4 inches above the base of the coal.

Weir-Pittsburg coal bed.—The Weir-Pittsburg coal bed has been called the "Cherokee" bed and the "Lower" bed. It occurs about 200 feet below the top and near the middle of the Cherokee shale. The interval from the Weir-Pittsburg coal to the base of the Cherokee is about 175 feet in the northern part of Crawford

TABLE 2.—*Average analysis and heating value of the Weir-Pittsburg coal* (Allen, 1925, p. 191)

Kind of sample	Proximate analysis in percent					British thermal units
	Moisture	Volatile	Fixed carbon	Ash	Sulfur	
A	3.26	33.55	54.24	8.95	4.26	13,402
B	——	34.68	56 06	9.26	4.40	13,860
C	——	38.22	61.78	——	——	15,270

A, Sample including moisture and ash.
B, Sample, moisture free basis.
C, Sample, moisture and ash free basis.

County and about 250 feet in Cherokee and Labette Counties. The bed ranges from 34 to 42 inches in thickness. This bed is thickest and has produced more coal than any other coal bed in the Southeastern Kansas coal field. It is worked by 19 small deep mines in Cherokee and Crawford Counties and by 1 strip mine in Crawford County. The total production from this bed was 538,645 tons in 1945. Proximate analyses and heating values of the Weir-Pittsburg coal are show in Table 2.

Mineral coal bed.—The Mineral coal bed has been called "Upper Weir-Pittsburg," "Twenty-two Inch," "Baxter," and "Upper Cherokee," and has been erroneously known as the "Lightning Creek." This bed lies from 65 to 80 feet above the Weir-Pittsburg coal. The coal ranges in thickness from 18 to 24 inches and has an average thickness of about 22 inches. It has been strip mined in an area extending southwestward from the northeastern part of Crawford County to the west-central part of Cherokee County. It has also been strip mined in southeastern Labette County and there have been a few small deep mines in Cherokee County. Table 3 gives proximate analyses and heating values of the Mineral coal.

The total production of coal from the Mineral and Fleming beds was 1,459,494 tons in 1945.

TABLE 3.—*Proximate analyses and heating values of Mineral coal*
(Analyses by Pittsburg and Midway Coal Mining Company)

Kind of sample	Proximate analysis in percent					British thermal units
	Moisture	Volatile matter	Carbon	Ash	Sulfur	
mine run	4.1	34.2	47.4	14.3	4.8	12,149
6x3 inch	3.4	35.2	48.8	12.6	3.8	12,420
3x2 inch	3.6	35.6	48.7	12.1	3.6	12,480
2x1¼ inch	3.9	36.2	49.8	10.1	3.3	12,765
1¼x1 inch	6.2	35.9	48.7	9.2	3.1	12,880

Fleming coal bed.—The Fleming coal is extremely variable in occurrence and thickness. It is mined in Crawford and Cherokee Counties in the Pittsburg district. The bed has a maximum thickness of 18 inches; the average thickness mined, however, is about 12 inches. Where present the bed usually lies from 10 to 20 feet above the Mineral coal bed. Proximate analyses of the Fleming coal are shown in Table 4.

TABLE 4.—*Proximate analyses and heating values of Fleming coal*
(Analyses by Pittsburg and Midway Coal Mining Company)

Kind of sample	Proximate analysis in percent					British thermal units
	Moisture	Volatile matter	Carbon	Ash	Sulfur	
mine run	3.8	38.4	45.6	12.2	4.9	12,650
6x3 inch	3.1	39.0	49.2	8.7	4.3	13,450
3x2 inch	3.5	39.2	49.0	8.3	3.6	13,480
2x1¼ inch	3.8	39.5	49.0	7.7	3.4	13,570
1¼x1 inch	6.1	38.5	47.9	7.5	3.2	13,250

The total production of coal from the Mineral and Fleming beds was 1,459,494 tons in 1945.

Croweburg coal bed.—The Croweburg coal has been called "Fireclay," "Huntsinger," and "Mud Seam." The bed lies about 25 feet above the Mineral coal and has an average thickness of about 12 inches. It has been mined in many small strip pits in northeastern Crawford County and southeastern Labette County.

Bevier coal bed.—The Bevier coal bed is known locally as the "Drywood Seam," "Pioneer Seam," "Limestone Bed," and "Lightning Creek Bed." It lies just above the Ardmore limestone and about 100 feet below the top of the Cherokee shale. The coal has an average thickness of about 18 inches. The Bevier coal is mined in southeastern Labette County, northwestern Cherokee County, south-central and northeastern Crawford County, and in southeastern Bourbon County. Table 5 gives proximate analyses of the Bevier coal.

The total production of coal from the Bevier bed was 1,101,704 tons in 1945.

TABLE 5.—*Proximate analyses and heating values of Bevier coal*
(Analyses by Pittsburg and Midway Coal Mining Company)

Kind of sample	Proximate analysis in percent					British thermal units
	Moisture	Volatile matter	Carbon	Ash	Sulfur	
mine run	3.9	36.9	45.1	12.1	2.8	11,840
6x3 inch	3.2	35.5	48.5	12.8	2.7	12,380
3x2 inch	3.6	36.4	47.5	12.5	2.6	12,320
2x1¼ inch	3.8	37.3	47.7	11.2	2.8	12,640
1¼x0 inch	5.9	36.8	48.8	8.5	2.5	12,855

TABLE 6.—*Coal production from strip mines in Kansas, by counties, in 1944 and 1945*

County	No. of mines		Average no. of days worked		Total no. of employees		Total production, tons		Average tons of coal per man-day	
	1944	1945	1944	1945	1944	1945	1944	1945	1944	1945
Bourbon	5	5	211.0	179.6	74	74	213,730	179,419	38.05	39.45
Cherokee	15	14	197.9	178.4	433	384	1,365,719	1,264,102	176.01	142.82
Crawford	15	12	142.4	147.8	461	441	1,423,190	1,448,781	144.22	153.05
Labette	3	2	127.0	81.5	11	5	6,393	1,883	13.59	10.92
Linn	1	—	210.0	——	3	—	1,022	———	1.62	———
Osage	3	4	133.3	117.5	12	16	7,653	9,836	12.31	21.44
Wilson	—	1	——	50.1	—	4	———	500	———	2.50
Totals	42	38			994	924	3,017,707	2,904,521		

Mulky coal bed.—The Mulky coal bed lies from 3 to 5 feet below the top of the Cherokee shale. The average thickness of the Mulky coal is 8 to 12 inches in areas where it has been mined in northern Crawford and southern Bourbon Counties. This coal bed is sometimes locally called "Bunker Hill," "Fort Scott," or "Redcoal." It was strip mined in 1945 by two small steam shovels in northern Crawford and southern Bourbon Counties.

Summit coal bed.—The Summit coal locally overlies the lower limestone member of the Fort Scott limestone in northeastern Bourbon County, where it ranges from a fraction of an inch to 2 feet in thickness. It is mined in northeastern Bourbon County 3 to 4 miles east and 4 miles north of Hammond.

Mulberry coal bed.—The Mulberry coal occurs in the lower part of the Bandera shale, a few feet above the Pawnee limestone. It ranges in thickness from 5 inches in the southern part of Bourbon County to 42 inches near LaCygne in northern Linn County. The average thickness at the localities where it is mined is about 26 inches. A bed of pyrite nodules about 2 inches thick lies about halfway between the base and the top of the coal bed.

The Mulberry coal has been strip mined near Fulton, Bourbon County, and Prescott, Manty, Pleasanton, and Mound City in Linn County. There were no strip mining operations of the Mulberry coal bed in Kansas in 1945.

Thayer coal bed.—The Thayer coal bed lies in the upper part of the Chanute shale. It is a persistent bed extending from Miami County to Montgomery County. It ranges in thickness from less than 1 inch to a maximum of about 26 inches in Wilson County.

The Thayer coal has been mined in the vicinity of Blue Mound in Linn County and west and southwest of Thayer in Neosho and Wilson Counties. The only strip mining operation of the Thayer coal in 1945 was one mine located about 5 miles west of Thayer in Wilson County.

Nodaway coal bed.—The Nodaway coal is a very persistent coal which occurs in the Howard limestone near the top of the Severy shale. The coal crops out along a northeast-southwest line from Doniphan County through Osage County to Chautauqua County. It ranges in thickness from 1 inch to 18 inches, the average thickness in Osage County being about 15 inches. The Nodaway coal was strip mined in 1945 near Carbondale and Osage City in Osage County.

COAL MINING COMPANIES OPERATING STRIP MINES IN KANSAS DURING 1945

Production of coal by strip mine operations in Kansas is shown by counties in Table 6; production data are from unpublished reports in the office of the State Mine Inspector.

The areas that were stripped on January 1, 1946, and the location of the active strip mine operations are shown on Plate 1.

The names of coal strip mines active in 1945, their locations, and total production are shown by counties in Tables 7 to 11. The Hi-Heat Coal Company mine in the SW¼ sec. 21, T. 29 S., R. 17 E. was the only active strip mine in Wilson County in 1945. Its total production was 500 tons.

TABLE 7.—*Active coal strip mining companies operating in Bourbon County, Kansas, in 1945*

Company	Location Sec.	T.S.	R.E.	Total production, tons
Double Eagle Coal Co.	SE¼ 12	27	24	7,353
Drywood Coal Co.	NW¼ 29	27	25	9,531
Kelly-Carter Coal Co.	NW¼ 35	26	25	154,266
Palmer Coal Co.	Cen. 23	26	25	4,942
Pellett Coal Co.	NE¼ 19	27	25	3,127
Total				179,419

TABLE 8.—*Active coal strip mining companies operating in Cherokee County, Kansas, in 1945*

Company	Location Sec.	T.S.	R.E.	Total production, tons
Black Diamond Coal Co.	32	31	25	1,322
Central Minerals Co.	NE¼ 24	32	23	6,650
Commercial Fuel Co.	NW¼ 36	31	23	282,242
Industrial Coal Co.	SW¼ 36	32	23	2,000
Johnson Coal Co.	NW¼ 36	31	23	1,000
Kansas Coal Co.	NE¼ 30	32	24	21,699
Maplewood Coal Co.	NW¼ 22	31	23	493
Markley Coal Co.	SE¼ 6	32	22	4,195
Mineral Products Co.	SE¼ 5	32	23	31,236
Pittsburg-Midway Coal Co. Mine No. 15	NW¼ 27	32	22	478,728
Pittsburg-Midway Coal Co. Mine No. 18	NE¼ 26	31	22	384,126
C. L. Smith & Co.	NE¼ 24	32	23	33,180
Victory Coal Co.	NW¼ 16	31	23	7,601
Wilkinson Coal Co.	SW¼ 23	32	24	9,630
Total				1,264,102

TABLE 9.—*Active coal strip mining companies operating in Crawford County, Kansas, in 1945*

Company	Location Sec	T.S.	R.E.	Total production, tons
Apex Coal Co.	SE¼ 32	30	24	188,755
Atlas Coal Co.	NW¼ 13	31	24	20,231
Barbero Coal Co.	SE¼ 32	30	24	1,300
Cliff-Carr Coal Co.	SW¼ 35	28	25	3,183
Eagle-Cherokee Coal Co.	SE¼ 21	30	24	137,027
Jonnum Coal Co.	NE¼ 36	30	24	1,130
Lightning Creek Coal Co.	SE¼ 1	31	22	130,671
Mackie-Clemens, Mine No. 22	SE¼ 24	28	25	255,324
Mackie-Clemens, Mine No. 23	NW¼ 21	29 and	25	685,469
	NE¼ 16	29	25	
Menghini Coal Co.	NW¼ 4	30	25	13,042
Palmer & Son Coal Co.	NE¼ 11	29	25	814
Victory Coal Co.	SE¼ 28	27	25	11,835
Total				1,448,781

TABLE 10.—*Active coal strip mining companies operating in Labette County, Kansas, in 1945*

Company	Location Sec.	T.S.	R.E.	Total production, tons
Oswego Coal Co.	SW¼ 27	33	21	594
Stokesberry-Simmons Coal Co.	SW¼ 9	35	2	1,289
Total				1,883

TABLE 11.—*Active coal strip mining companies operating in Osage County, Kansas, in 1945*

Company	Total production, tons
Carbondale Coal Co.	1,030
Ellis Graham Coal Co.	535
H. A. Rogers & Son Coal Co.	4,174
Superior Coal Co.	4,097
Total	9,836

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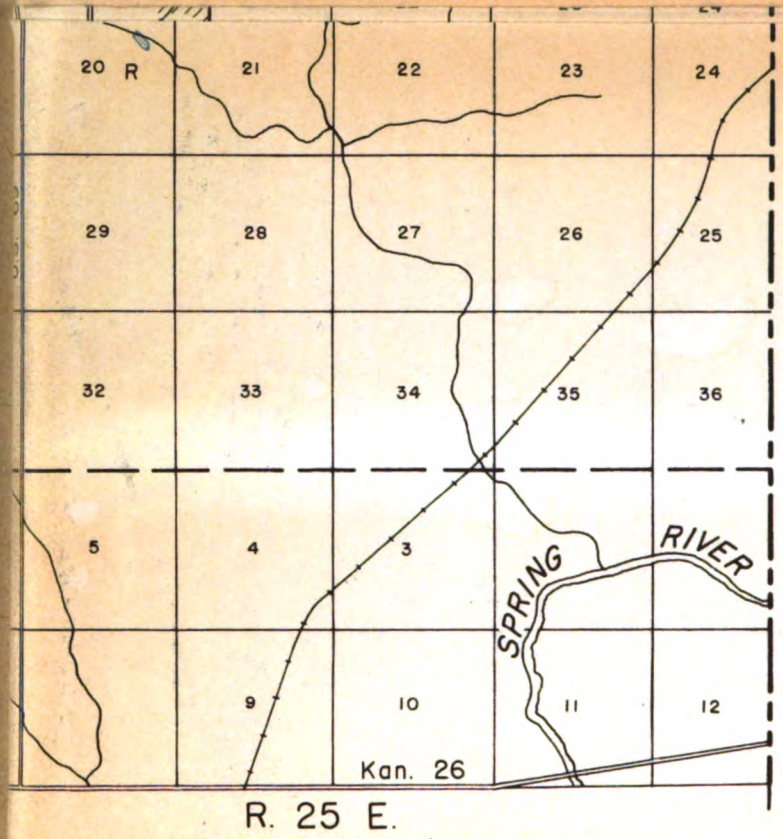


R. 25 E.

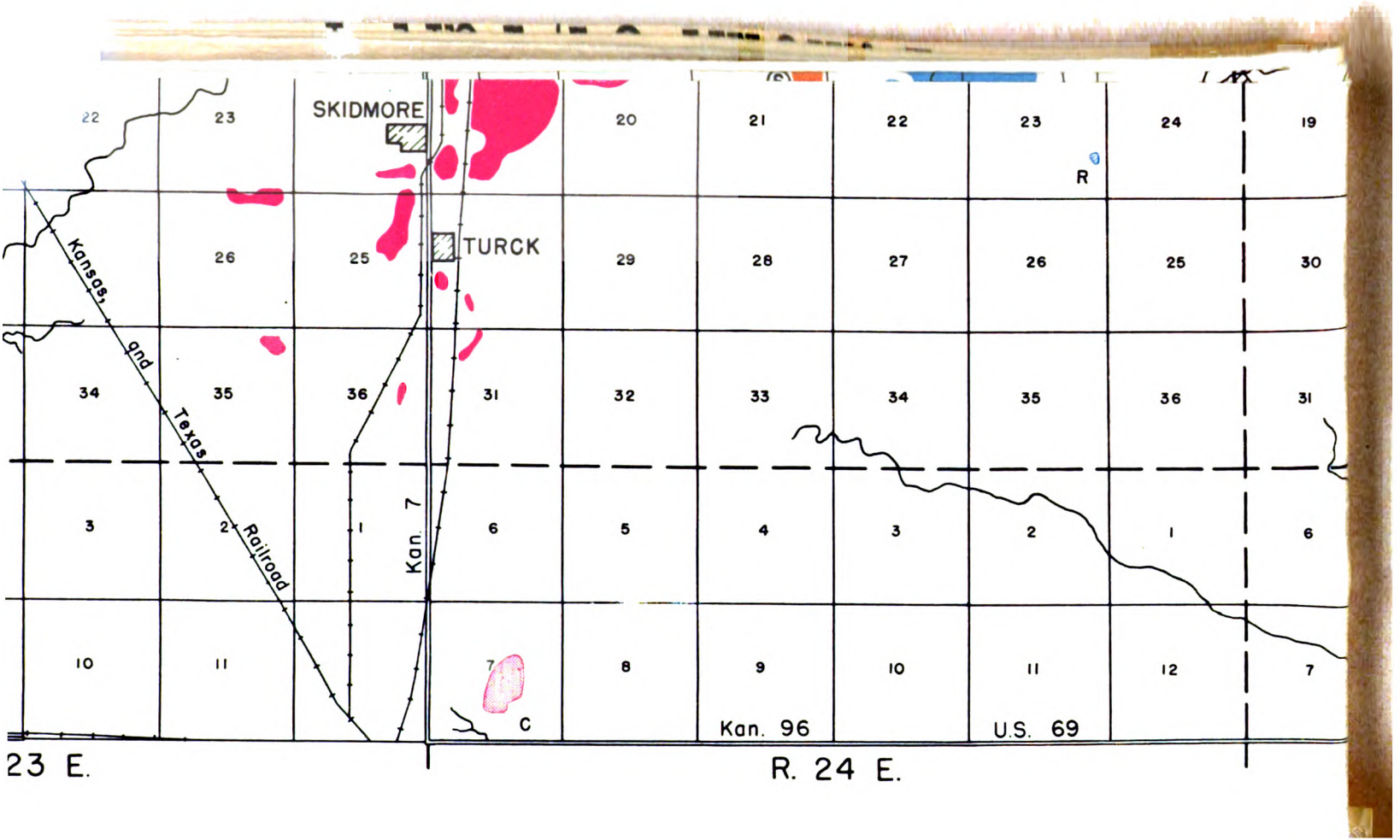
Ⓟ pyrite concentrating plant

Ⓢ stripping shovel

Ⓦ coal washing plant

0 1 2 3 4

scale in miles



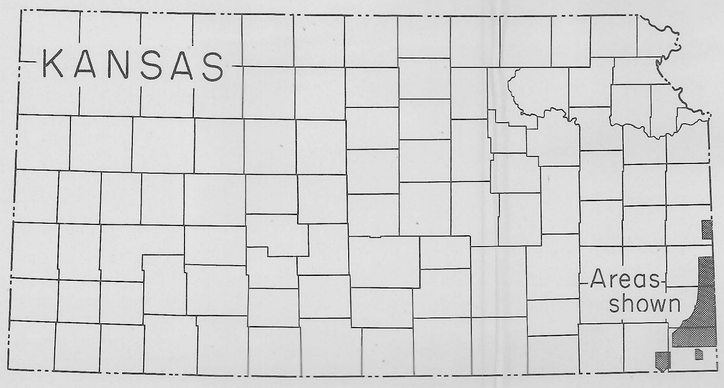
AREAS OF COAL STRIP MINES IN SOUTHEASTERN KANSAS

as of January 1, 1946

by G. E. Abernathy

State Geological Survey
of Kansas

Bulletin 64, Part 4
Plate 1



EXPLANATION

- Mulberry coal bed
- M — Mulky coal bed
- Bevier coal bed
- Croweburg coal bed
- Mineral coal bed
- Weir-Pittsburg coal bed
- R — Rowe coal bed
- C — Columbus coal bed
- (D) drag line
- (P) pyrite concentrating plant
- (S) stripping shovel
- (W) coal washing plant

0 1 2 3 4
scale in miles